

Genetics I

Concurrent session

8:10 AM

Friday, January 29, 2021

1 PROSPECTIVE STUDY OF EPILEPSY IN NGLY1 DEFICIENCY

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10.1136/jim-2021-WRMC.1

Purpose of Study To refine the electroclinical phenotype of epilepsy in *NGLY1* deficiency via prospective clinical and electroencephalogram (EEG) findings in an international cohort.

Methods Used We performed prospective phenotyping of 28 subjects with *NGLY1* deficiency via standardized clinician interviews every 4 months of medical, developmental and seizure history. Seizure and medication history was confirmed with prior records. 14 subjects also underwent in-person evaluations including EEG, obtained via 20 lead standard array. Descriptive statistics are provided for the first year of an ongoing natural history study.

Summary of Results All subjects had typical symptoms including: global developmental delay and/or intellectual disability, hypo- or alacrima, hyperkinetic movement disorder and transient elevation in transaminases. 17/28 (60.7%) had a history of epilepsy, with mean seizure onset at 37 months (interquartile range 5–60 months, range 2 months to 19 years). Seizure types included myoclonic (8/17, 47%), astatic (7/17, 41%), and absence (6/17, 35%); focal with secondary generalization, tonic, generalized tonic clonic, and infantile spasms were also reported. 10/14 (71%) subjects had generalized interictal epileptiform activity on EEG. EEG background was otherwise normal without slowing in the majority of subjects. Commonly used antiseizure medications were valproate, levetiracetam, lamotrigine, and clobazam. 7/17 subjects achieved complete seizure control on a variety of medications.

Conclusions We highlight a significant risk of epilepsy in *NGLY1* deficiency and detail the clinical and electrographic features identified in our international cohort. Seizure semiology is varied, with predominant myoclonic, astatic and absence seizure types with onset most commonly in infancy or early childhood. EEG abnormalities are non-specific and indicate a genetic risk of epilepsy, but most patients do not have EEG slowing which is a correlate of encephalopathy. Seizures often require treatment with multiple medications. Commonly used medications in various combinations include valproate and clobazam, indicating hepatic tolerance of these medications. Providers should educate caregivers about varied seizure types to ensure prompt detection and treatment of epilepsy.

2 CLINICAL WHOLE GENOME SEQUENCING IN YOUNG CHILDREN WITH AUTISM SPECTRUM DISORDER: A PILOT STUDY

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10.1136/jim-2021-WRMC.2

Purpose of Study Genomic sequencing has identified a growing number of genes associated with developmental brain disorders and revealed the overlapping genetic architecture of autism spectrum disorder (ASD) and intellectual disability (ID). Children with ASD are often identified first by psychologists or neurologists and the extent of genetic testing or genetics referral is variable. Applying clinical whole genome sequencing (cWGS) early in the diagnostic process has the potential for timely molecular diagnosis and to circumvent the diagnostic odyssey. Here we report a pilot study of cWGS in a clinical cohort of young children with ASD.

Methods Used Children with ASD and cognitive delays/ID were referred by neurologists or psychologists at a regional healthcare organization. Medical records were used to classify probands as 1) ASD/ID or 2) complex ASD (defined as 1 or more major malformations, abnormal head circumference, or dysmorphic features). cWGS was performed using either parent-child trio (n=16) or parent-child-affected sibling (multiplex families; n=3). Variants were classified according to ACMG guidelines. Pathogenic/likely pathogenic variants associated with ASD/ID were considered molecular diagnoses while variants of uncertain significance were considered candidate variants.

Summary of Results 19 children (9 females) received cWGS at a median age of 4 yrs (range 2.0–7.5 yrs). Six children were classified as complex ASD. cWGS identified a molecular diagnosis in 6 females of which 5 were complex ASD. All molecular diagnoses were due to rare *de novo* variants (*CSNK2B*, *DDX3X*, *LZTR1*, *MED12*, *PUM1*, *SMARCA2*). No molecular diagnoses were reported for males; 4 males had candidate variants. Three females had medical management changes including condition-specific surveillance and eligibility for targeted therapy.

Conclusions These preliminary results highlight the contribution of rare *de novo* variants in children with ASD with cognitive delays, consistent with prior research literature. Additional diagnostic testing beyond *MECP2* sequencing and chromosomal microarray should be considered for females with ASD, particularly with complex phenotypes.

3 PHENOTYPIC CHARACTERIZATION OF WAC RELATED INTELLECTUAL DISABILITY DUE TO A NOVEL SPLICING VARIANT

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Purpose of Study Describe the phenotype/natural history of 3 non-related individuals with a novel splicing variant in the *WAC* gene (c.381+4_381+7delAGTA). Provide proof of pathogenicity to support variant reclassification as pathogenic.

Methods Used Literature & retrospective chart review, clinical evaluation, in-silico & in-vitro RNA splicing studies.

Summary of Results We identified 3 non-related boys from Mexican (P1), Spaniard (P2) and French (P3) ancestry carrying the same *de novo* splicing variant (c.381+4_381+7delAGTA) in the *WAC* gene. All patients manifested with global developmental delay and intellectual disability (borderline - moderate). Except for non-specific mild dysmorphism, patients are healthy without major medical comorbidities.

All patients were ascertained through whole-exome sequencing. For P1, variant was initially classified as of uncertain significance (ClinVar). In-silico analysis showed location in the 5' splice site of intron 4 and predicted loss of a splice site in exon 4. RNA experiments derived from P2 confirmed aberrant splicing and showed a truncated protein: p.Gly92Alafs*2.

Review of literature & patient databases supported that WAC related intellectual disability is a condition characterized by neurodevelopmental features of variable severity. Additional findings might include dysmorphism & seizures. Compared to patients with other variants, only 1 of our cohort shared the described facial gestalt. Another overlapping condition, 10p11.2-p12.1 deletion, encompassing WAC and other genes, manifests with neurodevelopmental disorders and facial dysmorphism, suggesting that dysmorphism might be related to other gene/factor interactions.

Conclusions In our small cohort with WAC intron 4 splicing variant, the common feature was developmental delay and intellectual disability of variable severity. These data suggest weak genotype-phenotype correlations and support the contribution of other factors to the cognitive and dysmorphic phenotype. Based on the guidelines for interpretation of sequence variants, by performing functional studies and identifying non-related individuals we provide sufficient evidence to classify this variant as pathogenic.

4 IDENTIFICATION OF CEP68 AS A CANDIDATE GENE FOR INSULIN CLEARANCE AND TYPE 2 DIABETES

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10.1136/jim-2021-WRMC.4

Purpose of Study Insulin clearance (IC), the removal of insulin from the circulation, is a major determinant of plasma insulin levels and has been implicated in the development of type 2 diabetes (T2D). However, the molecular mechanisms regulating insulin clearance remain poorly understood. Through a genome wide association study (GWAS) in mice, we previously identified chromosomal loci regulating insulin clearance, 9 of which overlapped with established T2D human loci suggesting a causative relationship between the two. The aim of this study was to identify candidate genes for insulin clearance based on these loci for future experimental studies.

Methods Used We used publicly available databases and bioinformatic approaches to analyze genes and genetic variants at each of the chromosomal loci. Candidate genes were identified by expression quantitative trait locus (eQTL) analysis as implemented at the GTEx Portal. The functionality of coding variants was predicted by PolyPhen and SIFT, whereas non-coding variants were analyzed through HaploReg and RegulomeDB.

Summary of Results Our initial analysis identified candidate genes at 3 chromosomal loci. ZNF771 harbored a missense variant associated with T2D, whereas CEP68 and JAZF1 showed significant cis-eQTLs in the liver. JAZF1 and ZNF771 were not pursued further, as JAZF1 has previously been characterized in insulin secretion and the ZNF771 coding variant was predicted to be benign. Further analysis of T2D-associated noncoding variants within the CEP68 gene identified a single nucleotide polymorphism (rs2252867) predicted to affect chromatin binding of the PRDM10 transcription factor.

Conclusions Through bioinformatic analyses, we identified CEP68 as a novel genetic determinant of insulin clearance and T2D. Our results suggest a model, where genetic variation at rs2252867 affects CEP68 expression through altered chromatin-binding and transcription factor activity of PRDM10. Endosomal trafficking, a process mediated by microtubules, which are organized in centrosomes, is integral to insulin clearance. Based on our results, we hypothesize that, as a centrosomal protein, CEP68 may have a role in the endosomal process of insulin clearance and T2D susceptibility. The role of CEP68 and PRDM10 in IC and T2D will be tested in future functional studies.

5 URINE LUCK: A RARE CASE OF A CONGENITAL DISORDER OF GLYCOSYLATION DIAGNOSED BY URINE OLIGOSACCHARIDES

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Purpose of Study Congenital Disorders of Glycosylation (CDG) are a group of disorders caused by defective synthesis and processing of glycoconjugates. Diagnosing CDGs can be difficult due to their varied clinical presentations and multi-system organ involvement. Mannosyl-oligosaccharide glucosidase CDG (MOGS-CDG aka type IIb) is a very rare CDG with fewer than ten reported cases in the literature. In addition to being poorly characterized, carbohydrate-deficient transferrin is typically normal, hindering the diagnosis. Here, we report a case of MOGS-CDG, summarize the medical literature, and describe a useful biomarker in urine.

Methods Used Medical literature and chart review, physical examination, laboratory testing.

Summary of Results A 13-month old boy with global developmental delay, microcephaly, laryngomalacia, hepatomegaly, and poor vision was admitted to the intensive care unit for hypercapnia and hypoxemia. Physical examination was notable for hypotonia, high-arched palate, pectus excavatum, clenched hands, and limited purposeful movements. A CDG was suspected; however, carbohydrate-deficient transferrin analysis was normal. Whole Exome Sequencing revealed biallelic missense variants of uncertain significance in MOGS NM_006302.2:c.[2126T>C];[1619G>A]. Urine qualitative oligosaccharide analysis by liquid chromatography-tandem mass spectrometry identified an abnormal elevation of a tetrasaccharide distinct from glucose tetrasaccharide (Glc4) and malto-tetraose (M4), likely consistent with the known metabolite in this condition, Glc3Man1.

Currently, there are eight cases of MOGS-CDG reported in the literature from six families. Marked hypotonia, hypogammaglobinemia, and hepatomegaly are among the common features reported. The fatality rate before age one is 56% (5/9, including our study).

Conclusions CDGs should be considered in any child with severe developmental delay, failure to thrive, multi-system organ disease, and characteristic facial features. Normal carbohydrate-deficient transferrin analysis can be seen in CDGs, especially type II CDGs like MOGS-CDG. Urine oligosaccharide analysis may be useful for obtaining the correct diagnosis. Additional cases are needed to better delineate the phenotype and solidify diagnostic techniques for this ultra-rare disorder.

6 SHORT BONES, RENAL STONES, AND DIAGNOSTIC MOANS: HYPERCALCEMIA IN A GIRL FOUND TO HAVE COFFIN-LOWRY SYNDROME

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Purpose of Study Coffin-Lowry syndrome (CLS) is an X-linked semidominant disorder caused by pathogenic variants in *RPS6KA3*. In hemizygous males, CLS is characterized by intellectual disability, distinctive facial features, digit anomalies, and progressive kyphoscoliosis. Heterozygous females may also have features of CLS; however there is considerable phenotypic variation thought to be secondary to ratios of X-inactivation in various tissue types. While skeletal anomalies and short stature are hallmarks of CLS, hypercalcemia has not been reported.

Methods Used Clinical evaluation, molecular sequencing, chart review, and literature review.

Summary of Results Here we describe a 21 month-old girl with gross motor delays, progressive short stature, and dysmorphic features requiring multiple admissions for idiopathic hypercalcemia necessitating bisphosphonate infusions at 12 and 15 months of age. Family history is notable for mother with decreased height compared to 1st-degree relatives and bilateral genu valgum; no hypercalcemia or developmental delays reported. Exam revealed frontal bossing, depressed nasal bridge with anteverted nares and bulbous nasal tip, everted lower vermilion border, and tapered fingers. Prior evaluation included a normal skeletal survey, chromosomal microarray, and calcium homeostasis panel. Exome sequencing revealed a maternally-inherited likely-pathogenic variant in *RPS6KA3*, consistent with the diagnosis of CLS in our patient, as well as her mother. No other variants were reported.

Conclusions Hypercalcemia is not a reported feature in CLS; however, there is evidence of interrupted osteoblast differentiation, providing a potential mechanism for hypercalcemia. The hypercalcemia in this case may represent a severe presentation of an unrecognized phenotype that resolves with age. Exome sequencing provided this family a diagnosis with valuable reproductive implications for parents and maternal relatives. This case highlights the intrafamilial phenotypic variation of CLS among females. Future aims include X-inactivation studies and evaluation of maternal relatives.

7 NOVEL PHENOTYPE OF BONE MARROW FAILURE IN HUWE1-ASSOCIATED INTELLECTUAL DISABILITY AND SKEWING OF X-CHROMOSOME INACTIVATION IN MATERNAL BLOOD SUPPORT ROLE OF HUWE1 IN HEMATOPOESIS

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Purpose of Study Missense variants in the *HUWE1* gene are associated with X-linked intellectual disability (ID) and non-familial features including deep-set eyes, epicanthic folds, blepharophimosis, broad nasal tip and thin upper lip. Mild, intermittent neutropenia has also been reported and induced ablation of *Huwe1* in mice results in depletion of

hematopoietic stem cell populations. Although girls can be affected, some affected boys inherit *HUWE1* variants from unaffected mothers. Skewed X-chromosome inactivation (XCI) is speculated to attenuate the effect of *HUWE1* mutation in these individuals. Our study investigates the extent of skewed XCI in this condition and discusses the importance of *HUWE1* in hematopoietic homeostasis.

Methods Used We performed literature review and chart review of patients who underwent exome sequencing at ARUP laboratories or identified through GeneMatcher. XCI studies were performed on maternal blood to assess skewed X-inactivation patterns.

Summary of Results Here we report a male who presented prenatally with hydrops fetalis and intrauterine growth restriction and at birth was found to have severe pancytopenia. Exome sequencing identified a *HUWE1* missense variant (p.Arg3805Lys) inherited from his unaffected mother. Two additional boys with clinical findings consistent with *HUWE1*-associated ID harbored different missense variants inherited from healthy mothers. XCI analysis of all three mothers demonstrates extremely skewed X inactivation (>90:10).

Conclusions The finding of bone marrow failure in a patient with *HUWE1*-associated ID recapitulates the *Huwe1* hematological phenotype observed in mice and may represent the most severe presentation of this condition. Mechanistically the dependence of hematopoietic stem cell renewal on *HUWE1* could account for the XCI skewing observed in heterozygote mothers. We provide further evidence for the utility of XCI studies in ascribing pathogenicity to inherited missense *HUWE1* variants.

8 A RARE CO-OCCURRENCE OF AICARDI GOUTIERES SYNDROME WITH BI-ALLELIC POLG1 VARIANTS IN A CHILD OF CONSANGUINEOUS PARENTS

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10.1136/jim-2021-WRMC.8

Purpose of Study To describe the first reported patient in literature to be simultaneously affected by both Aicardi Goutieres and a mitochondrial depletion syndrome. To discuss the utility of the Adrenoleukodystrophy screen in picking up Aicardi Goutieres, and the use of muscle and liver biopsies to evaluate the pathogenicity of novel *POLG1* variants.

Methods Used Infant was born to parents who were first cousins, presenting with a history of severe IUGR. The child was admitted to NICU and his newborn screen returned positive for Adrenoleukodystrophy (ALD). Whole genome sequencing (WGS) was performed. WGS was negative for changes in the *ABCD1* gene (ALD) but was positive for biallelic likely pathogenic variants of *TREX* (Aicardi Goutieres) as well as biallelic variants of unknown significance of *POLG1*. Liver and muscle biopsies were sent to evaluate for mitochondrial disease.

Summary of Results Patient was homozygous for identical variants of both conditions, suggesting both parents were carriers due to consanguinity. Aicardi Goutieres is a disorder which often mimics congenital infection with a period of regression and neonatal encephalopathy resulting in neurological devastation. *POLG1* produces a subunit of a DNA polymerase (Pol γ) which is active in mitochondria and is involved in the

replication of mtDNA. Pathological variations produce a wide range of mitochondrial disorders. Patient phenotype included neonatal encephalopathy seen in Aicardi Goutieres, but regression characteristic of mitochondrial dysfunction.

Conclusions Patient was positive for ALD on newborn screen, and literature shows previous Aicardi Goutieres patients similarly identified. Patient's muscle and liver biopsy were abnormal, suggesting pathogenicity of his POLG1 variants.

Healthcare research I – therapies

Concurrent session

8:10 AM

Friday, January 29, 2021

9 THE ACCURACY OF CLINICAL AND OBSTETRICAL POINT OF CARE ULTRASOUND (POCUS) IN ESTIMATING FETAL WEIGHT VERSUS ACTUAL BIRTH WEIGHT: A PILOT PROSPECTIVE STUDY OF RIO BRAVO FAMILY MEDICINE RESIDENCY PROGRAM

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Purpose of Study The purpose of this study is to compare the accuracy of clinical and obstetric POCUS methods of predicting fetal weights at term via a pilot prospective study of 35 antepartum patients.

Methods Used A total of 40 full term pregnant women were included in the study. Five were excluded for insufficient data. Clinical fetal weight were estimated using Dare's formula (abdominal circumference x fundal height) and ultrasound (Hadlock) measurements.

Summary of Results Analysis of the data showed that clinical estimation of the fetal weight using Dare formula (DFW) over-estimated the actual birth weight (ABW). Ultrasound (UFW) estimation of fetal weight showed no significance when compared to ABW. The ABW had a mean of 3247.46 ± 434.27 grams (g) while UFW had a mean of 3182.2 ± 410.44 g. The p-value of UFW and ABW was 0.2991 indicating no statistical significance.

The mean of DFW was 3948.1 ± 534.12 g. When comparing DFW versus ABW, the average difference was 700.64 g. A p-value of 0.00 indicated statistical significance with DFW being greater than ABW.

BMI of the mothers was considered with the mean was 30.71 ± 4.72 . Minimum BMI was 24 and a maximum BMI of 42. When taking into account the absolute errors, no correlation was found between BMI and clinical weight estimation.

Conclusions In the study, DFW overestimated fetal weight. UFW and ABW showed no significance in estimation. Similar results were seen in a 1994 study by Shamley et al. Clinical overestimation of fetal weight can lead to earlier intervention in macrosomia infants which can lead to decreasing the risk of labor complications especially in a population where the utilization of ultrasounds is not possible. When properly trained in clinical techniques, clinicians can determine the course of management.

10 EFFECTS OF MINDFULNESS MEDITATION ON PATIENT SATISFACTION DURING URODYNAMIC STUDY

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Purpose of Study Urodynamics (UDS) are used frequently to assess lower urinary tract symptoms (LUTS) and bladder function. UDS requires intravesical, vaginal or rectal transducer placements, and placement of perineal electrodes. Prior studies show that although well tolerated in most, some patients may have heightened anxiety and feelings of discomfort. Some studies suggest that a mindfulness-based stress reduction (MBSR) protocol may help improve a patient's emotional health and perception of UDS.

Methods Used A retrospective review was conducted of patients who underwent UDS between June and August 2020. All patients underwent a standardized educational protocol about UDS prior to the study. Patients were divided into meditation group and non-meditation group. The meditation group listened to a pre-recorded meditation prompt with audio headsets prior to starting UDS. All patients completed validated questionnaires to assess their anxiety and pain levels, LUTS before and after intervention including STAI-6, VAS, and a UDS-validated perception questionnaire. Statistical analysis was conducted using paired T-Test, independent T-test, and Chi squared. A p-value of <0.05 was considered statistically significant.

Summary of Results Out of 30 patients identified, meditation was used in 16 patients and non-meditation in 14 patients. The patients of both groups were comparable in age, gender, living situation, education level, and ethnicity. Patient's in the meditation group had higher pelvic pain rates (1.7 compared to 1.1 $p=0.002$). There were no statistically significant differences in pre- and post-UDS rates of overall anxiety. There was increased pain in the non-meditation group post-UDS (4.1 compared to 2.8, $p=0.02$). Patients in the meditation group reported more often that UDS was better than expected than in the non-meditation group (64.7%, $n=11$ versus 20%, $n=3$, $p=0.01$).

Conclusions Utilizing a mindfulness-based stress reduction (MBSR) protocol may improve a patient's perception of pain and satisfaction after UDS. Future randomized prospective studies are needed for further evaluation.

11 THE EFFECTS OF COUGH SUPPRESSION THERAPY ON VOICE SEVERITY

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Purpose of Study Chronic cough (CC) is a global problem, affecting nearly 10% of the world population.^{1,2} Patients report negative psychological effects of CC on their quality of life and voice.³ However, the relationship between CC and voice disorders remains unclear. The purpose of this study was to determine if treatment of CC using Cough Suppression Therapy (CST) contributed to improvement in the self-reported severity of both cough and voice disorders. We also examined if length of CST treatment was related to patients' self-assessment of changes in their chronic cough and voice disorder.

Methods Used Subjects were selected from patients presenting with CC to the Loma Linda University Voice and Swallowing Center. Forty-four adult patients met the inclusion criteria of CC > 8 weeks, CST therapy, and pre and post-treatment Voice Handicap Index-10 (VHI-10) and Cough Severity Index (CSI) measures. All subjects underwent pre and post-treatment exam by videostroboscopy and completed pre and post-treatment validated VHI-10 and CSI assessments. Subjects received CST from a licensed Speech Language Pathologist. All subjects had an additional diagnosis of a voice disorder. Patients were divided into two groups based on their VHI scores. Twenty-seven patients were assigned to the cough (C) group and seventeen to the cough-voice (CV) group. Descriptive statistics were used to determine the differences between pre and post-treatment VHI-10 and CSI scores. A nonparametric Rho correlation coefficient was used to determine the relationship between the number of treatment sessions and changes in the VHI-10 and CSI.

Summary of Results Post-test analysis showed significant improvement in cough for both groups and significant improvement in voice for the 17 subjects in the CV group. The VHI-10 scores for the C group did not change significantly. The correlation between voice disorder severity and number of treatment sessions was not significant at the tested level.

Conclusions This study demonstrated that patients with CC and voice disorders have favorable responses to CST. Exercising or massaging a group of muscles in the larynx with the intent of decreasing cough demonstrated a crossover effect to the treatment of the voice. This plasticity effect has also been observed in other therapeutic conditions.

12 DEVELOPMENT OF A QUESTIONNAIRE ON ACCESS TO SICKLE CELL DISEASE CARE IN THE INDIGENOUS THARU POPULATION OF NEPAL

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10.1136/jim-2021-WRMC.12

Purpose of Study Sickle cell disease (SCD) disproportionately affects the Tharu population of Nepal, a marginalized indigenous group concentrated in the Dang district. SCD is a structural hemoglobinopathy resulting in abnormal red blood cells with a tendency to occlude microvasculature. Since 2015, University of British Columbia medical students and a local community partner, Creating Possibilities, have improved access to SCD screening and diagnosis for the Tharu population. However, interviews conducted in 2016–2017 found that SCD-afflicted community members encounter a number of challenges to obtain treatment once diagnosed. The purpose of this study was to develop a questionnaire on barriers to accessing SCD care in this community.

Methods Used The Barriers to Accessing SCD Care Questionnaire was developed from items in existing scales, deductive and inductive item generation, and feedback from expert local partners. Reviewing literature on barriers to accessing healthcare in the Western region of Nepal informed region-specific questionnaire items, while literature on accessing SCD treatment in resource-limited settings informed SCD-specific questionnaire items. We also reviewed the literature on barriers to

treatment for various stigmatized chronic health conditions in low-resource settings.

Summary of Results Qualitative interviews with SCD-afflicted Tharu individuals in 2016–2017 identified inadequate local medical resources, transportation, financial strain, and limited awareness as barriers to care. Based on the literature review, we organized all survey items under the themes transportation, medical infrastructure, finances, community attitudes, and personal attitudes. The questionnaire includes closed-ended questions using a Likert scale, as well as open-ended interview prompts. It was made in collaboration with local community members to ensure it is culturally appropriate, needs-specific, and easily understandable. The questionnaire received ethics board approval, and interviews will begin once local health authorities lift COVID-19 restrictions.

Conclusions Results from the Barriers to Accessing SCD Care questionnaire will guide future community-based interventions.

13 TELEMEDICINE TRAINING TO IMPROVE HEALTHCARE ACCESS FOR SENIOR LIVING COMMUNITY RESIDENTS IN LEWISTOWN, MONTANA

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Purpose of Study In response to the coronavirus pandemic, the Central Montana Medical Center (CMMC) in Lewistown, Montana bolstered its telemedicine program while restricting in-person visits. Patients inexperienced with technology—especially the elderly—forewent care. The purpose of this study was to determine how telemedicine access can be improved for residents of Lewistown senior living communities (SLCs), defined as independent, assisted living and nursing home facilities for older adults.

Methods Used CMMC administration cite patient inexperience with technology and clinician buy-in as the largest barriers to telemedicine utilization (personal communication, July 28, 2020). To elucidate, Lewistown SLC administrators were surveyed. The vast majority did not assist residents with telemedicine visits, but almost all expressed interest in offering it if training were provided. CMMC clinicians were also surveyed. Most had no telemedicine training and few felt comfortable using it. Therefore, SLC staff and clinician training were identified as avenues to improve telemedicine delivery. Two studies were evaluated to ascertain the benefit of such interventions.

Summary of Results The first study found access to telemedicine and telemedicine-trained staff reduced emergency department (ED) use among SLC residents by 18% annually. Residents without access to such services experienced a 1% growth in ED visits (Shah et al., 2015). The second study assessed variability in medical care between virtual visit companies. Significant variations were observed across all measures, underscoring the necessity of provider telemedicine training (Schoenfeld et al., 2017). Both studies and SLC/clinician survey results were presented to CMMC administration.

Conclusions Training SLC staff to assist residents with telemedicine visits may increase telemedicine usage and healthcare access. Similarly, training CMMC clinicians on virtual physical exams and history collection may improve their confidence in telemedicine technology and quality of virtual care. The survey results and literature suggest both interventions would have a significant impact on telemedicine delivery in

Lewistown. Future steps include determining level of training for SLC staff and exploring telemedicine training programs for providers.

14 **KNOWLEDGE AND RISK PERCEPTION ABOUT HEPATITIS C: PRELIMINARY EVIDENCE FROM A CROSS-SECTIONAL STUDY OF ADULTS LIVING IN LOUISIANA**

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Purpose of Study In 2013, HCV killed more Americans than all other infectious diseases according to the CDC. In Louisiana, HCV affects underserved populations at a disproportionate rate. Even though direct-acting antivirals (DAAs) treatment is available, many barriers prevent adequate screening and treatment of at-risk populations.

The purpose of this study is to evaluate HCV risk perception and knowledge about testing and treatment. The larger goal is to understand how a telemedicine-enhanced healthcare model can be utilized to improve access and quality of care.

Methods Used This preregistered cross-sectional online study was approved by the IRB of Western University of Health Sciences (X20/IRB/031). Preliminary data was analyzed from a quantitative survey, collected between April 29-September 15, 2020, of volunteer participants, aged 18–99 years old, who were recruited online via social media platforms and in-person at various Access Health Louisiana Clinics. $N=39$ for preliminary data, with a goal of $N=100$. The survey includes questions regarding demographics, risk perception, access to care, and knowledge of HCV. Data was analyzed using ANOVA.

Summary of Results 3 out of 39 participants reported taking a DAA and were not included in the study. Most respondents (80.6%) perceived their overall health as excellent, very good, or good and correlated with risk perception. 14% reported HCV testing while 67% never tested. The two most cited reasons for not testing were believing they were not at risk and lack of provider recommendation for testing. Those who never tested included 24% from the Baby Boomer generation. Additionally, 66.7% had not heard of DAAs or knew that HCV was a curable disease. 52.7% of respondents believed that people with HCV would be treated differently if they disclosed their status and 69.5% believed that shame kept people from seeking treatment.

Conclusions These findings offer preliminary but critical evidence that increasing public knowledge and addressing stigma about HCV are key to increasing HCV screening and treatment. The various barriers impeding diagnoses and treatment of HCV patients include lack of awareness, access barriers, and affordable medication.

15 **ADEQUACY OF ANESTHESIA INFORMATION RECEIVED BY PEDIATRIC PATIENTS' PARENTS AND THEIR PREFERRED METHOD OF EDUCATION**

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10.1136/jim-2021-WRMC.15

Purpose of Study Anesthesiologists perform critical roles prior to, during, and following operations. Nonetheless, one of the

most common misconceptions patients have is that the anesthesiologist's responsibilities consist solely of keeping them asleep and awakening them. Education during the preoperative visit is important, but the optimal methods of disseminating information to patients remains elusive. Previous studies have assessed patient perceptions about anesthesia. However, there is minimal published literature looking at how education level affects patient understanding of the role of anesthesiologists and the methods by which these patients prefer to receive the necessary information. The goal of this project is to better understand patients' existing knowledge about anesthesia and their preference for the method by which this information is delivered.

Methods Used We asked parents of patients to complete a survey that would allow us to better understand their knowledge of the anesthesia administered to their child and opinions on how this information is shared. There is one version of the paper survey form, which includes 8 simple questions regarding how they obtained information regarding anesthesia, if the information was complete, and their preferences for how additional information should be delivered. We asked the parents to fill out the brief survey either during their child's preoperative or postoperative visit.

Summary of Results 62% of parents stated that anesthesia was a factor in their consenting to the procedure. 45% of these parents felt that more information regarding the anesthesia would have been helpful. 53% stated that receiving information directly from their doctor during the office visit is the preferred method of education.

Conclusions Anesthesia plays a significant role in parents' consenting to their child's procedure. Many questions remain surrounding the nature of the information that patients require and the methods by which such information is delivered. Directly exploring the views of patients and their family members will improve understanding of how to best educate them, which will hopefully decrease the degree of anxiety that patients face and lead to better anesthetic care.

16 **ADDRESSING ALCOHOL USE DISORDER IN PLAINS, MT THROUGH ONLINE MUTUAL SUPPORT GROUPS**

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10.1136/jim-2021-WRMC.16

Purpose of Study Plains, MT is a rural town of 1,149 people located in Sanders County. Within the county, 21.07% of people are considered heavy drinkers, compared to the national average of 14.71%. The need to address alcohol use disorder is outlined in the Clark Fork Valley Hospital (CFVH) 2017 Health Assessment and Implementation Plan, as a top priority. This need was further highlighted in community conversations that revealed a strong drinking culture within the town.

Methods Used Engagement with the community was informed by an asset-based approach. Community assets were identified through both clinical observation and interviewing CFVH's mental and behavioral health specialist and licensed clinical psychologist. Interventions were assessed using CFVH 2017 Health Assessment and Implementation Plan, integrated review, community conversations, and clinical observations.

Summary of Results Close teamwork between physicians and the Mental and Behavioral Health Department (MBHD) is one of CFVH's strongest assets in addressing alcohol use

disorder. This close communication allows for screening by providers and direct referral to the MBHD. The strong longitudinal relationship between patients and their providers results in better follow up, as they are referred by a trusted clinician. One potential interventional approach includes online mutual support groups focused on addressing the strong drinking culture. One advantage of this approach is continuous accessibility to 'someone like me.' This can be difficult to find in small towns with limited in-person participation. Further, online support groups offer a greater degree of anonymity, which can be of significant value to small communities. Lastly, online peer support groups offer a more flexible recovery plan compared to 12-step programs.

Conclusions This project identified a community asset as well as a potential intervention in addressing alcohol use disorder. One key element to increase intervention success is to take advantage of local and available community assets. Next steps include capitalizing on the patient referrals to the MBHD and providing online mutual support group resources. Potential challenges include limited access to computers/internet which can be addressed by simultaneously directing patients to computer access at the public library.

Neonatology – perinatal biology I

Concurrent session

8:10 AM

Friday, January 29, 2021

17 ANTENATAL SELENIUM DEFICIENCY DECREASES NEONATAL HEPATIC AND PLASMA GLUTATHIONE PEROXIDASE

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10.1136/jim-2021-WRMC.17

Purpose of Study Maternal selenium (Se) deficiency is associated with decreased neonatal Se levels and worse neonatal outcomes. Se deficiency in infancy increases the risk of morbidities related to oxidative stress. The mechanisms explaining this are unknown, and preclinical models of antenatal Se deficiency have not tested the impact of low Se during pregnancy on the neonate. Adult models demonstrate circulating and hepatic glutathione peroxidases (GPx) are selenoenzymes highly sensitive to Se intake. Thus, we developed a model of antenatal Se deficiency and assessed the effect on pregnancy, as well as plasma and hepatic selenoenzymes in the pups.

Methods Used C57Bl/6 mice received SeS (0.4 ppm Se) or SeD (<0.01 ppm Se) diets 2–4 weeks before breeding. Pups were sacrificed at P0. Liver was assessed for *Gpx1* mRNA, and GPx1, Trxrd1, SOD1, SOD2, SOD3, catalase and HO-1 protein content by Western blot. GPx activity was measured in liver and plasma by enzyme assay. F and M pups were analyzed as separate groups.

Summary of Results SeD pups had similar weights per litter but smaller litters than SeS ($p < 0.05$, $n = 8-9$ litters). Plasma GPx activity was decreased in SeD pups ($p < 0.01$, $n = 2$). Hepatic *Gpx1* mRNA, GPx1 protein and GPx activity were decreased in SeD pups ($p < 0.001$, $n = 4-5$). Hepatic Trxrd1

protein was not decreased if dams received short exposure to SeD diet (<10 weeks) but decreased if dams received prolonged SeD diet (>10 weeks) ($p < 0.05$, $n = 3-5$). To test if other antioxidant enzymes (AOE) increased in the setting of SeD, hepatic SOD1, SOD2, SOD3, catalase and HO-1 protein contents were measured and were not different between SeS and SeD pups, either with short or prolonged duration ($n = 4$). Sex differences were not observed in the mRNA, protein content or activity level of selenoenzymes or other AOE of SeS or SeD pups.

Conclusions Antenatal SeD decreases neonatal plasma and hepatic GPx, without sex differences in SeS or SeD pups. With prolonged SeD in dam, hepatic Trxrd1 is also decreased. Neonatal SeD pups do not demonstrate an increase in compensatory AOE. We speculate that both male and female SeD neonates may be vulnerable to oxidative stress secondary to low hepatic and circulating antioxidant enzymatic defense.

18 HYPOXEMIA DOES NOT POTENTIATE HYPOGLYCEMIA INDUCED GLUCOSE PRODUCTION IN FETAL SHEEP

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10.1136/jim-2021-WRMC.18

Purpose of Study Fetuses with placental insufficiency induced IUGR are hypoxemic, hypoglycemic and have early activation of hepatic glucose production (HGP). In previous work, hypoglycemia (5d to 8wk) activates both HGP and gluconeogenic gene expression while hypoxemia for 10d only potentiates gluconeogenic gene expression. Here, we test if hypoxemia and hypoglycemia (HOX+HG) would activate HGP more than hypoglycemia (HG) alone.

Methods Used Late gestation sheep were made HG via maternal insulin infusion to reduce fetal glucose ($n = 11$). A second group was made HOX+HG via maternal N₂ gas insufflation plus insulin to reduce fetal oxygen and glucose ($n = 12$). Fetal metabolic studies were performed before (d0) and after 5 days of treatment (d5). Data were analyzed with mixed model ANOVA to test for main effect of treatment (d0 vs d5), with post-tests comparing HG vs. HG+HOX on d5.

Summary of Results Glucose concentrations were 51% lower in both groups on d5 vs. d0 ($P < 0.001$). In HG+HOX fetuses, pO₂ decreased by 25% compared to HG fetuses on d5 and compared to both groups on d0 ($P < 0.001$). HG+HOX fetuses had increased lactate, cortisol, and norepinephrine (NE) concentrations compared to HG fetuses ($P < 0.005$) on d5. Insulin concentrations were decreased in both groups on d5 vs. d0 ($P < 0.001$) and were decreased further in HG+HOX compared to HG ($P = 0.05$). Glucose utilization rates were decreased while glucose production rates were increased similarly in both groups on d5 compared to d0 ($P < 0.05$).

Conclusions HGP was activated in both HG and HG+HOX fetuses. Thus, while glucose uptake from the placenta and fetal glucose utilization were lower on d5, utilization remained higher than uptake, demonstrating increased endogenous fetal HGP. Interestingly, despite decreased insulin and elevated cortisol and NE levels in the HG+HOX fetuses, these hypoxemia associated effects did not potentiate HGP. These data support a dominant role for hypoglycemia, not hypoxemia, in activating HGP in fetuses with placental insufficiency.

19 REDUCED VEGFA IS ASSOCIATED WITH DIFFERENCES IN THE MICROVASCULAR STRUCTURE IN IUGR SKELETAL MUSCLE

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10.1136/jim-2021-WRMC.19

Purpose of Study Skeletal muscle growth is reduced in the intrauterine growth restricted (IUGR) fetus. We previously reported that external iliac blood flow was similar between late gestation control (CON) and IUGR fetal sheep when normalized to hindlimb weight, indicating that hindlimb muscle growth slowed to match blood supply. Oxygen delivery due to lower blood oxygen content and oxygen consumption rates were reduced in the IUGR hindlimb. Acute hypoxemia is known to stimulate angiogenesis, but whether chronic hypoxemia induces angiogenesis is controversial. We hypothesized that muscle microvasculature would be reduced in the IUGR fetus as an adaptation to slow growth.

Methods Used Biceps femoris (BF) and tibialis anterior (TA) muscles were harvested from CON (n=8) and IUGR (n=13) late gestation fetal sheep. Genes that regulate angiogenesis were measured in BF using real-time qPCR. VEGFA protein was measured in TA by Western blot. Cross-sections of BF were incubated with anti-dystrophin to identify myofibers and *Griffonia simplicifolia* lectin to quantify vessel area and density. Total vascular, capillary-specific, and arteriole/venule-specific area to muscle area ratios and capillary number per myofiber were determined using Visiopharm Image Analysis software. Student's t-test was used, and $P < 0.05$ was designated as significant.

Summary of Results Angiogenic regulatory gene expression was either similar (*NOS3*, *THBS1*, *KDR*, *DLL4*, *NOTCH1/4*, *SPP1*) or lower (*ANGPT1*, *NCL*, *PGC-1 α* , and *CCL2*) in IUGR BF compared to CON ($P < 0.05$). Protein expression of VEGFA was 45% lower in IUGR TA ($P < 0.0005$). Vascular/muscle area, capillary/muscle area, and capillary number/myofiber ratios were similar between groups. However, arteriole and

venule/muscle area tended to be lower in IUGR ($P = 0.06$), and the capillary area/total vascular area was higher in IUGR ($P < 0.05$).

Conclusions Contrary to our hypothesis, microvasculature was maintained in IUGR muscle. However, an increase in the ratio of capillary area to total vascular area may indicate differences in branching morphogenesis in an attempt to compensate for chronic hypoxemia. We further speculate that reduced VEGFA may contribute to reduced skeletal muscle growth in IUGR.

20 CEREBRAL REGIONAL OXYGEN SATURATION DURING RESUSCITATION IN PERINATAL ASPHYXIAL CARDIAC ARREST

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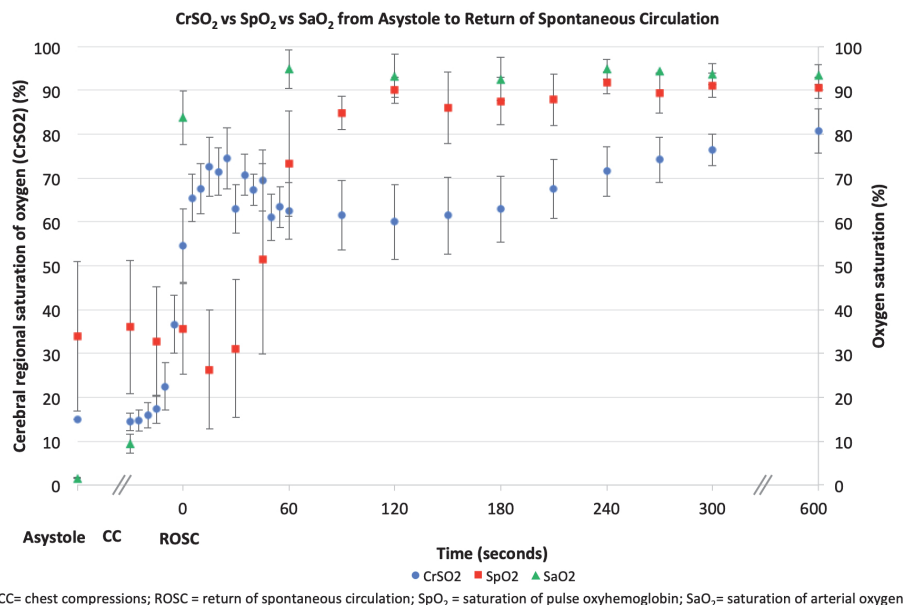
10.1136/jim-2021-WRMC.20

Purpose of Study Cerebral regional oxygen saturation (CrSO₂) measured by near-infrared spectroscopy (NIRS) can be used as an adjunct to oxygen saturation (SpO₂) monitoring in the delivery room. No studies have assessed the accuracy of NIRS in perinatal cardiac arrest.

Methods Used Nine fetal lambs were instrumented to measure blood pressure, carotid blood flow, preductal SpO₂, SaO₂ and CrSO₂. Cardiac arrest was induced by umbilical cord occlusion and lambs were resuscitated following NRP guidelines.

Summary of Results Average lamb weight was 4.0 ± 0.7 kg. Median time (IQR) to asystole was 17 (14–18) min. Median time (IQR) to return of spontaneous circulation (ROSC) was 4.4 (3.5–4.8) min. Figure 1 shows the relationship between CrSO₂, SpO₂ and SaO₂. CrSO₂ values quickly rise following ROSC along with increased O₂ delivery to the brain (figure 2). Pearson correlation comparing brain O₂ delivery to CrSO₂, SaO₂ and SpO₂ were 0.76, 0.76, and 0.61, respectively. Correlation comparing SaO₂ to CrSO₂ and SpO₂ were 0.77 and 0.59, respectively.

Conclusions In a perinatal asphyxiated lamb model, CrSO₂ correlates better than SpO₂ with brain oxygen delivery and



Abstract 20 Figure 1 Shows the relationship between CrSO₂, SpO₂ and SaO₂

Hemodynamic Parameters from Fetal Baseline to Return of Spontaneous Circulation

| Time | CrSO ₂ (%) | SpO ₂ (%) | Mean BP (mm Hg) | Left Q _{CA} (ml/min/kg) | DO ₂ (ml O ₂ /kg/min) |
|-------------------------|--------------------------|-------------------------|--------------------|-------------------------------------|--|
| Fetal baseline | - | 51 (19) | 60 (5) | 28 (10) | 2.5 (1.1) |
| Asystole | 15 (0)* | 34 (42) | 4 (2) | 0 | 0 |
| CC | 19 (11) | 30 (50) | 15 (4) | 4.3 (2.6) | 0.13 (0.07) |
| ROSC | 55 (20) | 36 (25) | 40 (21) | 16 (5) | 2.2 (0.9) |
| 1-min post-ROSC | 63 (14) | 73 (29) | 70 (21) | 28 (12) | 4.3 (1.4) |
| 2-min post-ROSC | 60 (24) | 90 (8) | 73 (22) | 31 (11) | 4.4 (1.3) |
| 3-min post-ROSC | 63 (26) | 85 (16) | 73 (22) | 31 (10) | 4.5 (1.5) |
| 4-min post-ROSC | 72 (20) | 92 (7) | 71 (22) | 31 (8) | 4.7 (1.2) |
| 5-min post-ROSC | 76 (16) | 91 (7) | 69 (21) | 30 (8) | 4.5 (1.1) |
| 10-min post-ROSC | 81 (11) | 91 (8) | 68 (20) | 32 (9) | 4.7 (1.2) |

Values represented in mean (\pm SD). BP = blood pressure; CC = chest compressions; CrSO₂ = cerebral regional saturation of oxygen; DO₂ = oxygen delivery; Q_{CA} = carotid flow; ROSC = return of spontaneous circulation; SpO₂ = saturation of pulsed oxyhemoglobin. *Lowest CrSO₂ reading is 15%

Abstract 20 Figure 2 CrSO₂ values quickly rise following ROSC along with increased O₂ delivery to the brain

SaO₂ and may help guide titration of FiO₂ following ROSC. Further studies are needed before implementation into clinical practice.

21

DISTINCT POPULATIONS OF DEVELOPING MACROPHAGES IN EMBRYONIC MOUSE LIVERS AND LUNGS

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10.1136/jim-2021-WRMC.21

Purpose of Study Macrophages play important roles in the innate immune system and inflammatory response. These phagocytic cells engulf and digest pathogens, infected or dying cells and debris, as well as recruit and regulate other immune cells and the inflammatory response and assist in tissue repair. Prior studies have shown that separate populations of macrophages exist in the developing fetus: fetal liver monocyte derived macrophages (CD11b^{HI}/F4/80^{LOW}) and yolk sac derived macrophages (F4/80^{HI}/CD11b^{LOW}). It has also been suggested that these populations serve different functions and have distinct inflammatory properties. Our study aims to further characterize the differences of these populations and identify their locations during early immune system development.

Methods Used Whole lungs and livers from E15 C57BL/6 mice were fixed with 4% PFA and passed through sucrose gradients prior to embedding in OCT compound for sectioning. Incubation of primary antibodies for macrophage markers CD14, CD68, F4/80, ID3 and immune response markers Ccl4, C1qA, IL-1 β and NLRP3 followed blocking for non-specific binding. Secondary antibodies were added after washing, followed by DRAQ5 nuclear staining. Imaging was done using a Leica TCS-SPE confocal microscope.

Summary of Results We were able to clearly identify the known macrophage marker CD68 in both lungs and livers. In addition, Kupffer cell marker ID3 showed robust expression in the liver samples. Interestingly, hematopoietic islands of yolk sac derived F4/80 macrophages were seen throughout the tissues rather than isolated in only one location. C1qA expressed was colocalized with some F4/80 expression and appeared to be in adjacent cells in the same area of the tissues.

Conclusions We were able to identify macrophage populations in the lungs and liver of E15 mice. Our identification of F4/80 hematopoietic islands demonstrate that the yolk sac derived cells do not remain in one location but disperse throughout the liver. The nearby location of C1qA could indicate that the F4/80 macrophage populations are involved with the complement system during development and, potentially, could indicate a functional difference of these cells. Learning the roles of these populations can lead to better understanding of neonatal immune system development, eventually enabling better therapeutic opportunities.

22

IN VITRO INHIBITORY POTENCY OF D-PENICILLAMINE ON HEME OXYGENASE ISOZYME ACTIVITY

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10.1136/jim-2021-WRMC.22

Purpose of Study Heme oxygenase (HO) is the rate-limiting enzyme in the bilirubin production pathway and exists as 2 well-described isozymes: HO-1 and HO-2. Identifying compounds that can selectively inhibit the inducible HO-1 without affecting the constitutive HO-2 isozyme is desirable for use in treating neonatal hyperbilirubinemia. D-Penicillamine, a compound primarily used for treating heavy metal (e.g. copper, lead) poisoning, has been shown previously to be effective in lowering total bilirubin levels in newborns, but its proposed mechanism of action via HO inhibition and, more importantly, its selectivity for the HO-1 isozyme, has not been explored. In this study, we evaluated the *in vitro* potency and selectivity of D-Penicillamine for the inducible HO-1 isozyme.

Methods Used Adult female FVB mice (28–30 g) were sacrificed to harvest spleen and brain, tissues containing primarily HO-1 and HO-2, respectively. D-Penicillamine (final concentration of 8.3 mg/mL) was added to reaction mixtures containing tissue sonicates, heme, and NADPH. After incubation in a 37°C water bath for 15 min, HO activity, as indexed by carbon monoxide (CO) production, was determined using gas chromatography and expressed as pmoles of CO produced/hr/mg fresh weight. Percent inhibition of HO activity was calculated. A selectivity index (SI) for HO-1, defined as the percent

inhibition of HO-1 (spleen) over HO-2 (brain) activities, was calculated, with a SI of > 1.0 indicative of a selectivity for the HO-1 isozyme.

Summary of Results D-Penicillamine at a concentration 8.3 mg/mL effectively decreased *in vitro* HO activity $37 \pm 3\%$ ($n = 3$), and $43 \pm 11\%$ ($n = 3$), for the HO-1 (spleen) and HO-1 (brain) isozymes, respectively. In addition, the calculated SI for HO-1 was 0.87, indicating an almost equal selectivity for each HO isozyme.

Conclusions D-Penicillamine can decrease *in vitro* HO activity and appears to have equal selectivity to inhibit both HO-1 and HO-2 isozymes. Further work is warranted to investigate whether D-Penicillamine has potential for use in the treatment of neonatal hyperbilirubinemia.

23 A NOVEL RAT MODEL OF INFLAMMATION DRIVEN DIFFUSE WHITE MATTER INJURY

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10.1136/jim-2021-WRMC.23

Purpose of Study Brain white matter injury (WMI) is a leading cause of neurological disabilities in preterm infants that can affect sensory, motor, and cognitive brain function. WMI ranges from severe, necrotic periventricular leukomalacia (PVL) to mild diffuse WMI that involves changes to Oligodendrocyte (OL) lineage cells and neurons. Diffuse WMI has emerged as the most prevalent form in modern neonatology. This has led to calls for relevant animal models that can more accurately mimic diffuse WMI. Previously, we have established a PVL-like model by intracerebral injection of a high dose of lipopolysaccharide (LPS) to neonatal rats. The aim of this study was to test the hypothesis that low-grade neuroinflammation caused by intracerebral injection of a lower dose of LPS may produce clinically relevant diffuse WMI.

Methods Used Sprague Dawley rats on postnatal day 5 (P5) were injected intracerebrally with LPS (100 $\mu\text{g}/\text{kg}$, in saline) or saline. On P7, we investigated injury and dysmaturity of OL lineage cells and neurons, activation of astrocytes and microglia, as well as damage to axons and dendrites, by immunohistochemistry and Western blot. Cells were quantified by stereological cell counting methods.

Summary of Results Our data show that a lower dose of LPS (1/10 of previous model) led to an activation of Iba1+ microglia and GFAP+ astrocytes across brain regions including the periventricular white matter and hippocampus. LPS treatment led to acute axonal damage shown by beaded β -amyloid precursor protein (β -app) positive fibers in the cortex, corpus callosum, and hippocampus; This was rarely observed in the control rats. In addition, reduction of Microtubule Associated Protein 2 (MAP2) staining and Doublecortin (DCX) protein levels in the hippocampus suggests neuronal dysmaturity. LPS resulted in a reduction in Rip+ later stage OLs but not PDGF receptor+ OL progenitor cells. There were no apparent necrotic brain damages noted in LPS-treated rats.

Conclusions The results suggest that a lower dose of LPS produces cellular and molecular features of diffuse WMI, characterized by injury and dysmaturity in both OLs and neurons that are increasingly seen as critical cellular substrates underlying cognitive and behavioral deficits in very premature infants.

24 STANDARDIZED CHITOSAN NANOPARTICLES

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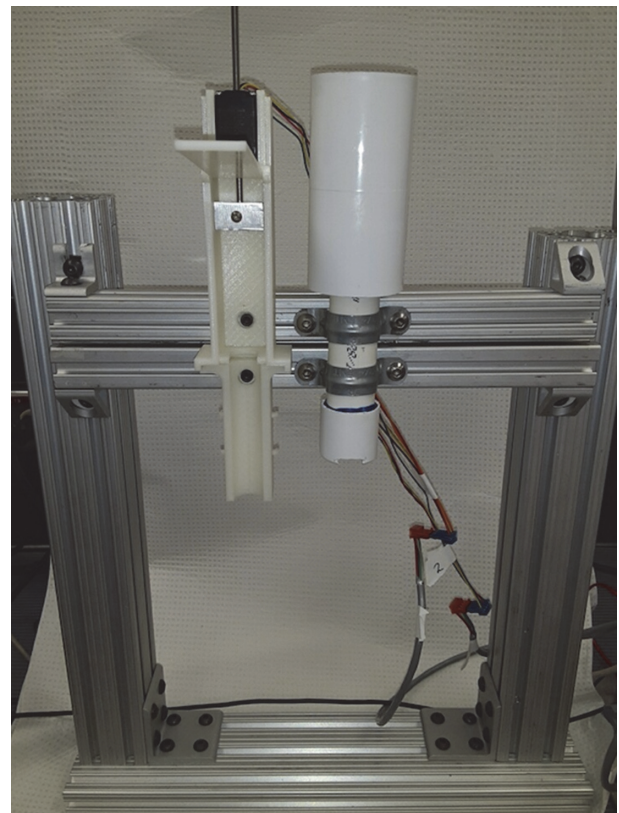
10.1136/jim-2021-WRMC.24

Purpose of Study Bypassing the blood-brain barrier via nasal insufflation, Diethylethylamine-Chitosan (DEAE-CH) nanoparticles (NP) show promise as a gene delivery system to the brain. Manual NP creation means sample inconsistency. The positive charge from DEAE-CH amines and the negative phosphates of a plasmid form an NP, but how they interact informs the size and shape of the particle. Past protocols produced particles too large and varied. Since microfluidics impacts NP formation, inconsistencies are likely due to the variability inherent in turbulent mixing. We hypothesize standardizing the mixing procedure for the creation of DEAE-CH NPs will provide smaller NPs between sample preparations.

Methods Used To investigate this, we assembled a device with software to create qualifying NPs with batch consistency. A prepared solution of DEAE-CH is combined with a substituted phosphate via motorized syringes connected to a 'Y' joint creating a laminar flow ideal for reliably consistent NPs. NPs were measured by dynamic light scattering.

Summary of Results Preliminary results suggest that our standardized system using this encapsulator produces nanoparticles in a much smaller range of 10 to 30 nanometers for an average of 18.4 nm, much smaller than previous manual attempts.

Conclusions Further study will determine what mixing rate provides the best laminar flow to create a predictable DEAE-CH NP for an effective gene delivery system.



Abstract 24 Figure 1 Two mounted motors extrude the content of syringes at fixed rates

Neuroscience I

Concurrent session

8:10 AM

Friday, January 29, 2021

25 PRECLINICAL PRENATAL ALCOHOL EXPOSURE AND PLACENTAL INSUFFICIENCY RESULT IN ALTERED CEREBELLAR PEDUNCLE MICROSTRUCTURE

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10.1136/jim-2021-WRMC.25

Purpose of Study Prenatal Alcohol Exposure (PAE), a continued common occurrence worldwide, is associated with neurodevelopmental abnormalities including impairments of behavioral and cognitive functioning. Additionally, placental insufficiency (PI), occurs concomitantly with PAE. The effect of PAE+PI on the cerebellum, a brain structure that functions in coordinating voluntary movements, is not fully understood. In this study we use magnetic resonance imaging (MRI) to assess whether PAE+PI results in microstructural abnormalities within the white matter fiber tracts that connect the cerebellum to the brainstem.

Methods Used Pregnant Long-Evans rats voluntarily drank 5% ethanol or saccharin water until embryonic day 18 (E18) to mimic moderate PAE. On E19, an open laparotomy was completed, and the uterine arteries were occluded for one hour. Pups delivered normally on E22 and matured with their dams. At postnatal day 100 (P100), tissue was collected, and the brains were scanned on a Bruker 7.0T MRI. Regions of Interest were analyzed with Bruker's Paravision 5.1 and diffusion eigenvectors measured. One-way ANOVA was used, with $p < 0.05$ significant ($n = 15-30$ /group).

Summary of Results Diffusion tensor imaging (DTI) analyses of the cerebellar peduncles showed decreases in fractional anisotropy (FA) in PAE+PI rats compared to controls. FA was decreased by nearly 16% ($p < 0.01$) in the superior cerebellar peduncle. In the inferior and middle cerebellar peduncle, the FA was decreased in PAE+PI compared to controls (decreased by ~5%) but did not reach significance. Additionally, increases in axial, radial and mean diffusivity were noted in PAE+PI compared to controls within the cerebellar peduncles, but significance was not reached.

Conclusions The cerebellar peduncles are sensitive to injury following PAE+PI in this preclinical study. Specifically, the superior cerebellar peduncle, which consists primarily of efferent pathways, is more vulnerable to injury following these prenatal insults compared to other areas of the cerebellum. Additional studies are needed to further characterize this injury and the impact this may have on function related to these critical brain regions.

26 SOMATIC MOSAICISM OF A SINGLE PLATELET DERIVED GROWTH FACTOR RECEPTOR BETA VARIANT: THE ROLE OF ALLELE FREQUENCY ON PHENOTYPE

F El-Ghazali*, M Ferreira. *University of Washington, Sammamish, WA*

10.1136/jim-2021-WRMC.26

Purpose of Study Aneurysmal dilatations weaken arterial walls and put them at risk for catastrophic rupture. Germline variants and environmental contributions account for a minority of aneurysms and little is known about the role of somatic events in pathogenesis. Recently, our group described an index patient with a somatic mosaicism pattern of a unique vascular and cutaneous phenotype. Whole exome sequencing of affected vascular tissue revealed an activating somatic variant in platelet derived growth factor beta (*PDGFRB*) with allele fractions between 2–40%. This variant was absent from matched blood DNA and unaffected tissues from throughout the body. Ten years later, the patient suffered a deadly subarachnoid hemorrhage and the family elected scientific donation. We aimed to study the *PDGFRB* allele fraction to histopathologic phenotype relationship throughout the patient's body.

Methods Used The institutional review board at the University of Washington approved all research conducted. Postmortem tissue specimens along with cell lines were harvested and mirrored tissue specimens were processed for both DNA extraction and histology. A unique digital droplet polymerase chain reaction (ddPCR) assay specific for the *PDGFRB* variant (p. Tyr562Cys [g.149505130T>C (GRCh37/hg19)] was developed to study allele fractions at a 20,000x depth coverage. Obtained allele frequencies were compared to the pathogenic phenotype.

Summary of Results The patient developed intracranial, radial and coronary artery aneurysms ipsilateral to the cutaneous phenotype. There was no aortic involvement and contralateral vasculature was normal. ddPCR revealed the presence of variant gradient in all affected tissue. Interestingly, the aorta and unaffected arteries did not harbor the variant. We will discuss the allele frequency relationship to phenotype throughout the patient's vascular tree and tissues.

Conclusions The *PDGFRB* variants are associated with both cerebral and coronary aneurysms. The aorta was spared without evidence of aneurysmal changes. This is in contrast to inheritable connective-tissue diseases such as Ehlers-Danlos (vascular type) syndrome and Loeys-Dietz syndrome, where an aortic phenotype is uniform. This is the first described case of a *PDGFRB* variant - gradient map showcasing somatic mosaicism with a vascular phenotype.

27 EFFECT OF PREOPERATIVE OPIOID USE ON POST OPERATIVE OPIOID DEMAND AND LENGTH OF STAY FOLLOWING SPINAL FUSION FOR TRAUMA

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10.1136/jim-2021-WRMC.27

Purpose of Study Preoperative opioid use (POU) has been well-studied in elective spinal surgery and correlated with numerous postoperative complications. Prior to this study, there was a paucity of data available on surgery for spine trauma, possibly because there are minimal options for opioid reduction prior to emergent spinal surgery. Patients with spine trauma are at a high risk for adverse postoperative outcomes. This retrospective cohort study investigated the effects of POU on postoperative opioid demand (POD) and length of stay (LOS) in traumatic spinal surgery.

Methods Used 130 patients were grouped into two groups for primary comparison: Group 1 (Preoperative Opioid Use, N=16) and Group 2 (No Opioid Use, N=114). Two subgroups of Group 2 were used for secondary comparison: Group 3 (No Substance Abuse, N=95) and Group 4 (Other Substance Abuse, N=19). POD was defined as average morphine equivalents per day (mg/day) and LOS was defined as number of days between surgery and discharge. Multivariate analysis was used to determine if there were significant differences in the POD and LOS between groups.

Summary of Results Primary analysis demonstrated that preoperative opioid users required an estimated 97.5 mg/day more opioid medications compared to non-opioid users ($p < 0.001$). Secondary analysis showed a similar increase in POD when comparing preoperative opioid users to patients with no history of substance abuse ($p < 0.001$) and to patients with history of other substance abuse ($p < 0.001$). Neither primary nor secondary analysis showed a difference in LOS between any of the groups.

Conclusions Preoperative opioid users had increased POD compared to non-opioid users, but there was no difference in LOS between the groups. Preliminary investigation reveals very similar results when comparing preoperative opioid users to non-substance abusers and other substance abusers. We theorize the lack of difference in LOS between groups may be due to the enhanced perioperative recovery protocol used for these patients, which has been demonstrated to reduce LOS. Further investigation into long-term outcomes is the next step for this research.

28 BIOINFORMATIC COMPARISONS OF ZEBRAFISH AND RATS AFTER SPINAL CORD INJURY

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10.1136/jim-2021-WRMC.28

Purpose of Study Humans respond to spinal cord injury (SCI) similarly to rats by forming a glial scar with limited functional recovery. In contrast, zebrafish regenerate their spinal cords after injury with functional recovery. This study was designed to explore the similarities and differences between the molecular mechanisms of SCI in zebrafish and rats.

Methods Used We analyzed transcriptional datasets from zebrafish and rats deposited in the Genome Expression Omnibus. To analyze differentially expressed genes, we used the online tool, GEO2R. We adjusted p-values using the Benjamini & Hochberg procedure for control the false discovery rate and identified differentially expressed genes. For each dataset, we compared sham-controls to injured spinal cord samples using the author-defined identification provided. We next obtained Gene Ontology (GO) and Kyoto Encyclopedia of Genes and Genomes (KEGG) enrichment results of the differentially expressed genes. Lastly, we compared these results between injuries and species.

Summary of Results There were a total of 43,289 differentially expressed genes with an adjusted p-value cutoff of 0.01 identified between sham and injured samples. Analysis across species with the same mechanism of injury identified 609 differentially expressed genes that overlapped. Differentially

expressed genes were enriched in pathways related to cell cycle, development, RNA/DNA processes, and neuron function/anatomy. In addition, we found overlap between zebrafish and rats.

Conclusions The differences in regenerative capacity between zebrafish and rats were highlighted by the significant difference in how these common pathways are upregulated or downregulated across species and mechanism of injury. For example, zebrafish regulate genes for intracellular processes whereas rats regulate more extracellular processes. These differences may contribute to the contrasting functional recovery seen between these species after spinal cord injury. Identifying these differences may lead to identification of new therapeutic targets and strategies to promote regeneration in humans.

29 ALTERED EXPRESSION OF HSPA1B AND DNAJB1 IN BRAIN OF CALPAIN-1 KNOCKOUT MICE

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10.1136/jim-2021-WRMC.29

Purpose of Study A major isoform of calpains in the brain, calpain-1, participates in both synaptic plasticity and neuroprotection. While calpain-1 activation is required for long-term potentiation induction and is neuroprotective, calpain-2 activation limits the magnitude of LTP and is neurodegenerative.

Methods Used Using RNASeq analysis, we identified several differentially expressed genes, including HSPA1B and DNAJB1, in the brain of calpain-1 KO mice as compared to wild-type mice. HSPA1B codes for a heat shock protein, which stabilizes proteins against aggregation and helps folding of newly synthesized proteins. DNAJB1 is another member of the heat shock protein family and participates in protein folding and protein complex assembly. In the present study, we examined the expression of the two proteins encoded by these two genes using quantitative immunohistochemistry in frozen brain sections from adult wild-type and calpain-1 KO mice.

Summary of Results We found that knockout mice have lower expression of DNAJB1 and HSPA1B proteins.

Conclusions These results suggest a novel role for calpain-1 in the regulation of heat shock proteins in the brain.

30 SUPEROTEMPORAL RETINAL AMYLOID IMAGING SIGNALS PATHOLOGIC NEURODEGENERATION AND MEMORY DEFICITS IN SUBJECTS WITH COGNITIVE DECLINE

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10.1136/jim-2021-WRMC.30

Purpose of Study Considerable evidence reveals that amyloid-beta (A β) abnormality consistent with Alzheimer's disease (AD) pathology manifests early before clinical symptomatology, including cognitive decline. However, current amyloid-

PET brain imaging visualizes cerebral A β plaque with limited accessibility. Given that retina is the only CNS organ not enclosed by bone, newly developed direct and noninvasive retinal amyloid imaging (RAI) bypasses the shielded brain and aims to improve clinical relevance. Despite advances in imaging retinal amyloidosis, quantitative and topographical investigation of retinal A β burden in patients with cognitive impairment was never reported. Here, we used specific amyloid-binding fluorophore curcumin and laser ophthalmoscopy to examine RAI in patients with cognitive decline.

Methods Used All 34 subjects underwent neurological examination and neuropsychological tests including Montreal Cognitive Assessment (MOCA) and Clinical Dementia Rating (CDR) scale. We quantified retinal amyloid count (RAC) and area in the superotemporal quadrant and its sectoral segmentations and conducted correlation analyses with cognitive and brain volumetric parameters.

Summary of Results Total RAC was significantly different between CDR groups. On subregion analysis, the proximal mid-periphery (PMP) showed significantly more amyloid in subjects with worse dementia. Patients with lower MOCA scores had increased RAC and area in the PMP, along with decreased total intracranial volume and hippocampal volume (HV). Notably, total RAC and PMP RAC significantly correlated with HV and CDR.

Conclusions RAI is feasible and detects increased retinal A β burden, especially in the PMP, in patients with mild cognitive impairment. PMP retinal A β may predict HV, supporting retinal A β as a useful biomarker to trace AD progression.

31 PRENATAL ALCOHOL EXPOSURE AND PLACENTAL INSUFFICIENCY ALTER NEURONAL COMPLEXITY IN RAT PREFRONTAL CORTEX

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10.1136/jim-2021-WRMC.31

Purpose of Study Prenatal alcohol exposure (PAE) produces long-term neurological deficits and is associated with placental insufficiency (PI). Alas, the combined neurological impact of PAE and PI remains unknown. Here, we utilized a three-dimensional (3D) Sholl analysis to compare PAE, PI, and PAE+PI neuronal morphology in the frontal cortex, a critical region for cognition. We hypothesized that PAE+PI would induce a distinct pattern of altered dendritic complexity relative to either insult alone.

Methods Used Pregnant rats voluntarily drank 5% alcohol or saccharin water until embryonic day 18 (E18) to mimic moderate PAE. On E19, a laparotomy was performed to induce PI via transient uterine artery occlusion. On postnatal day 100, brains from PAE+PI (n=16), PAE (n=12), PI (n=11) and control (n=15) groups, processed with Golgi-Cox, were sectioned coronally. Imaris 3D Sholl analysis was conducted on the apical and basal processes of confocal-imaged neurons in the medial prefrontal cortex (mPFC) and Area 25 of the Cingulate (A25). For statistical comparisons, 2-way ANOVAs and t-tests were used.

Summary of Results Within the mPFC, PAE and PI groups showed increased basal complexity (PAE: 10–80 μ m, PI: 10–80 μ m), whereas PAE+PI showed decreased basal complexity

at 100 μ m, relative to controls. Conversely, the mPFC apical processes of PI show increased complexity (70, 80 μ m), while PAE and PAE+PI exhibited decreased complexity (PAE: 60–100 μ m, PAE+PI: 70, 90 μ m). Within A25, we found that only the apical dendritic complexity of PAE neurons differed from controls, showing increased complexity at 40 and 120 μ m.

Conclusions Here, we demonstrate that the pattern of brain injury exhibited by preclinical PAE+PI, characterized by decreased basal and apical dendritic complexity in the mPFC, is distinct from that of PAE or PI alone. Intriguingly, the A25 region of the prefrontal cortex demonstrated reduced vulnerability to PAE, PI, and PAE+PI insult, compared to the mPFC as a whole. These data suggest heightened susceptibility of the apical dendritic arbor to PAE+PI insult.

COVID – infectious diseases I

Concurrent session

9:05 AM

Friday, January 29, 2021

32 ASSOCIATION OF CORONAVIRUS DISEASE 2019 (COVID-19) AND STROKES IN YOUNG AND MIDDLE-AGED ADULTS

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10.1136/jim-2021-WRMC.32

Purpose of Study COVID-19 has been associated with endothelial damage and coagulopathy. Data on characteristics of cerebrovascular disease due to COVID-19 in non-elderly adults is scant. The objective of this study is to investigate the characteristics of young and middle-age adults who presented with strokes as the main manifestation of COVID-19.

Methods Used A literature review was performed on PubMed and Google Scholar databases using the key terms 'stroke', 'COVID-19', 'young adult', and 'SARS-CoV-2'. We included studies that described patients under the age of 60 who were admitted for neurological signs or strokes. For studies that included adults of all ages, we describe the characteristics of patients who were younger than 60 years old.

Summary of Results Of the 23 articles found, 8 satisfied our inclusion criteria. A total of 31 patients younger than 60 years old with stroke as the primary manifestation of COVID-19 were identified. All patients had a positive test for COVID-19, and all had neurological symptoms on admission. The vast majority had a confirmed stroke diagnosis upon admission, and only a few were diagnosed within the first few days of admission. Of 31 patients, 24 (77%) showed mild to moderate respiratory symptoms, and 4 patients presented with neurological symptoms but no other COVID-19 related symptoms. Stroke was defined as cryptogenic or involved the large vessels leading to cerebral infarcts in majority of cases.

Conclusions Our literature review suggests that there is an association between strokes as the main manifestation of COVID-19 in young and middle-aged adult patients.

Abstract 32 Table 1 Studies of Young and Middle-Aged Adults with COVID-19 and Strokes.

| Author name, year and location of study | Total number of patients (N) | NIHSS* score upon admission | Symptoms on Presentation | Previous cardiovascular history | MRI findings (infarction or thrombus location) |
|---|---|---------------------------------|--|---|--|
| Ashrafi 2020 Iran | N= 6, mean age= 43.5 ± 7.42, range= 33–53 | 10.16 ± 7.13 | (4/6) had respiratory symptoms, (6/6) had hemiparesis and/or dysarthria | (2/6) hypertension, (1/6) diabetes mellitus and hypertension, (3/6) no co-morbidities | (3/6) right middle cerebral artery, (2/6) left middle cerebral artery, (1/6) left basal ganglia |
| Klein 2020 Hempstead, New York | N= 1, Age= 29 | Not Reported | Mild respiratory symptoms and seizures | None | left tempoparietal, thrombosis in distal left transverse and sigmoid sinus |
| Fara 2020, New York | N=3 (two were < 60), Patient 1= 55, Patient 2= 33 | Not Reported | Mild Respiratory symptoms and hemiplegia in both patients | 1/2 had diabetes | (3/3) right carotid artery |
| Oxley 2020, New York | N= 5, range= 33–49, mean= 40.4 | mean=16.8 | (5/5) with focal weakness, hemiplegia and/or dysarthria, (2/5) patients had no COVID symptoms, (2/5) had mild respiratory symptoms | (2/5) previously healthy, (1/5) hypertension, (2/5) diabetes, (1/5) hyperlipidemia | (2/5) left middle cerebral, (1/5) right internal carotid artery, (1/5) right posterior cerebral artery, (1/5) right middle cerebral artery |
| Yaghi 2020 New York | N=32 with stroke, 13 of 32 were younger than 60 years old | mean=19 for all stroke patients | Young adults (N=13): 11/13 (85%) had cough, fever and/or hypoxia, 2/13 (15%) had no symptoms | 7/13 (54%) Hypertension, 6/13 (46%) Hyperlipidemia, 5/13 (38%) Diabetes mellitus, 1/13 (7.7%) Coronary Artery disease, 1/13 (7.7%) Congestive heart failure | 9/13 (69%) Cryptogenic stroke, 2/13 (15%) Cardioembolic stroke, 1/13 (7.7%) Large vessel stroke, 1/13 (7.7%) Other |
| Tunc 2020, Turkey | N=4 (one was < 60) Patient 1= 45 | 16 | Mild respiratory symptoms and Left sided hemiparesis | None | Large vessel stenosis, right middle cerebral artery infarction |
| Cavallieri 2020, Italy | N=1, Age=33 | Not Reported | Mild respiratory symptoms, headache and balance disorder | None | bilateral cerebellar ischemic lesions |
| Diaz-Segarra, New Jersey | N=4, (two were < 60), Patient 1= 54, Patient 2=37 | Not Reported | Mild respiratory symptoms for one of two, respiratory symptoms for other one, and 2/2 with hemiparesis and/or aphasia | 1 with undiagnosed hypertension, and 1 with undiagnosed type 2 diabetes | Patient 1- Basilar artery and right superior cerebellar artery, Patient 2- left middle cerebral artery |

Healthcare provider awareness of this association can facilitate early recognition, diagnosis, and prompt treatment.

33 CASE CONTROL STUDY: D-DIMER AS A PROGNOSTIC FACTOR FOR DISEASE SEVERITY IN COVID-19 INFECTIONS

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10.1136/jim-2021-WRMC.33

Purpose of Study The Novel coronavirus was named COVID-19 by World Health Organization as it became an epidemic that swept across the world with over thirty million people infected. As biological research advances our understanding of this virus, clinical research has been critical in advancing our clinical management of the disease. It has been shown that covid-19 is associated with a hypercoagulable state and therefore an elevated d-dimer in this setting would be an appropriate response. However, the question remains whether an elevated d-dimer can be used as a marker of disease severity and as a prognostic factor for the patient.

The goal of this study is to assess the relationship between d-dimer and the severity of covid-19 infection. We aim to show that an elevated d-dimer at the time of covid-19 diagnosis is associated with increased severity and poor prognosis.

Methods Used We retrospectively analyzed the labs of 161 consecutive covid-19 positive patients at College Medical Center in Long Beach, CA from March 1st through September

21st of 2020. All patients who tested positive for COVID-19 were assessed through multiple logistic regression to examine the relationship between an elevated d-dimer level at time of diagnosis and the severity and inpatient mortality.

A list of all patients admitted to our community hospital in Long Beach, CA was created. Each patient was chart reviewed and all patients who tested negative or indeterminate for covid-19 were excluded. Furthermore, all who didn't have a d-dimer result during that admission were also excluded.

Other exclusion criteria included any patient who was on anti-coagulation therapy prior to admission, pregnant patients, those with active deep vein thrombosis, active pulmonary embolism, active malignancy, or history of genetic hypercoagulable state.

Summary of Results This is an ongoing study,

Conclusions This is an ongoing study

34 EPIDEMIOLOGIC CHARACTERISTICS OF MULTISYSTEM INFLAMMATORY SYNDROME IN CHILDREN (MIS-C) WITH A FOCUS ON OUTCOMES

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Purpose of Study Treatment outcomes of children diagnosed with MIS-C are unclear and warrant investigation. The

purpose of this study is to investigate the characteristics of pediatric patients diagnosed with MIS-C and their treatment outcomes with an emphasis on fatalities associated with MIS-C.

Methods Used A literature review using Google Scholar and Pubmed using keywords such as ‘Multisystem Inflammatory Syndrome in Children’, ‘Pediatric Inflammatory Multisystem Syndrome’, and ‘Coronavirus Disease 2019’ was conducted. We included studies of hospitalized MIS-C patients with a sample size of more than 15.

Summary of Results Of ten studies published before August 2020, five reported hospitalized MIS-C cases in the United States and five in Europe. A total of 514 hospitalized patients were reported with a sample size of 15 to 186 in various studies. Of 514 patients, 431 (84%) tested positive for SARS-CoV-2 via RT-PCR or serology. In different studies, 50% to 100% of MIS-C patients required PICU admission, 10% to 54% were intubated, and up to 80% required vaso-pressors. In studies that reported echocardiogram results, coronary artery dilations or aneurysm were noted in up to 93%, and depressed cardiac function was reported in 51–100% of MIS-C patients. Treatment of MIS-C patients included intravenous immunoglobulins (IVIG) 388/514 (75%) plus steroids 288/514 (56%), along with anticoagulants and Anakinra 26/514 (5%). In total, 23 patients were put on ECMO, and of those, 16 (70%) survived. The larger studies reported fatality rate of 2% to 3% in hospitalized MIS-C patients. A total of 10 deaths were reported. Of the fatality causes that were described, 3 were associated with cerebral infarction after ECMO, 2 had not received IVIG, systemic glucocorticoids, or immunomodulators, and another 2 had co-morbidities.

Conclusions Our review suggests that children with MIS-C who are hospitalized typically have a severe disease course. The outcome in vast majority of patients is favorable but death can occur, most likely as a result of cardiac dysfunction or cerebral infarction. Larger studies are needed to identify clinical features as well as laboratory and diagnostic parameters that predict disease severity and outcome.

35 IMPACT OF COVID-19 INFECTION ON PATIENTS POST-DISCHARGE

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10.1136/jim-2021-WRMC.35

Purpose of Study There is growing literature on the global psychological, social, and economic impact of COVID-19. Psychological outcomes including isolation, anxiety, and depression, are associated with adverse outcomes in patients with other diseases. There is little research examining the impact of infection on hospitalized COVID-19 patients post-discharge. The objectives of this study were to follow patients hospitalized with COVID-19 to evaluate symptom resolution, personal impact, and lasting worries.

Methods Used Patients were identified following discharge for COVID-19 infection from March-June 2020. Medical students called patients, obtained verbal consent, and administered a questionnaire about the impact of COVID-19 infection.

Abstract 35 Table 1 Emergent themes and frequencies

| Theme | Frequency (N=66) | Percent Frequency |
|-----------------------------------|------------------|-------------------|
| Isolation/Social Distancing | 23 | 34.8% |
| COVID-19 Reinfection/Transmission | 22 | 33.3% |
| Recovery | 17 | 25.8% |
| Relationships and Family | 13 | 19.7% |
| Fear | 12 | 18.2% |
| New and Chronic Health Issues | 11 | 16.7% |
| Death | 9 | 13.7% |
| Gratitude | 9 | 13.7% |
| Finance/Employment | 8 | 12.1% |
| Anxiety | 4 | 6.1% |
| Faith | 4 | 6.1% |
| Pride | 2 | 3.0% |

Responses were recorded with direct quotes. Clinical information on treatment and medical history was collected. Thematic analysis was conducted for responses to personal impact and worries. Two investigators coded responses on separate occasions and achieved code consensus.

Summary of Results Altogether 164 patients were identified. Of those, 66 individuals consented to the interview. Coded data resulted in table 1. The most common theme was isolation, closely followed by reinfection/transmission.

Conclusions In our population recovering from infection, there was a trend to isolate due to desire to not infect others or be reinfected. We hypothesize that future recovering patients will face similar psychological distress reentering into society. Anticipatory support with education on isolation and safety around reinfection may help reduce the impact of disease on discharged patients continuing recovery.

36 POTENTIAL FOR RECURRENCE OF CORONAVIRUS 2019 (COVID-19) IN RECOVERED PATIENTS

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Purpose of Study The objective of this study is to describe the characteristics of patients reported as having reinfection, recurrence or reactivation of COVID-19.

Methods Used A literature-based review of articles was conducted through databases Google Scholar and PubMed using key words: ‘COVID-19’, ‘SARS-CoV-2’, ‘re-positive’, ‘reinfection’ and ‘recurrence’. Only studies which identified patients with a positive viral RT-PCR during the 1st and 2nd episodes were included in our review.

Summary of Results We found 9 studies that satisfied our inclusion criteria. A total of 132 patients were identified as having a ‘reinfection’, ‘reactivation’ or ‘re-positive test’. At least one negative RT-PCR test was documented between the 1st and 2nd episode for all patients, except in the study by Batisse et al. All symptomatic patients at the time of 2nd positive test had mild to severe symptoms. 11/13 (84.6%) of the patients with severe symptoms during the 2nd episode were

Abstract 36 Table 1 Recurrence of COVID-19 Case Studies

| First Author, Year, Location | Number of subjects with reported recurrent infections/Total N, Age Range (Years) | Severity of 1st infection | Severity of 2nd infection | Time between 1st clinical cure & re-positive RT-PCR test (days) | N (%) patients with comorbidities | Outcome (hospitalization/fatalities) for those with re-positive test |
|----------------------------------|--|---|---|---|-----------------------------------|---|
| Batisse et al, 2020, France | Case series (N=11), Age range=19–91 | 4/11 (36.4%) mild condition, 7/11 (63.6%) severe | 4/11 (36.4%) mild condition, 7/11 (63.6%) severe; 6/7 (85.7%) of severe cases had comorbidities | 7–14 for mild cases (4/11), 4–27 for severe cases (7/11) | 7/11 (62.6%) | 3/11 (27.3%) fatalities: 2 died of ARDS recurrence, 1 from worsening chronic right-heart failure; 3/11 developed no antibodies >21 days after severe symptoms |
| Ye et al, 2020, China | 5/55 (9.1%), Age range=22–67 | 5/5 (100%) severe condition | 5/5 (100%) mild to moderate condition | 4–17 | 0/5 (0%) | No fatalities or development of severe pneumonia |
| Loconsole et al, 2020, Italy | Case report, Age 48 | 1/1 (100%) severe condition | 1/1 (100%) severe condition | 31 | 0/1 (0%) | No fatality, patient remains on anticoagulation therapy; only IgG antibodies detected during 2nd episode |
| Ravioli et al, 2020, Switzerland | Case reports (n=2), Age range=77–81 | 2/2 (100%) severe condition | 2/2 (100%) severe condition | 25 (patient 1) & 19 (patient 2) | 2/2 (100%) | 1/2 (50%) fatality, 1/2 (50%) hospitalized in COVID-19 isolation ward |
| Qiao et al, 2020, China | 1/15 (6.7%), Age 30 | 1/1 (100%) severe condition | 1/1 (100%) moderate condition | 15 | Not Reported | No fatality |
| Mei et al, 2020, China | 23/651 (3.5%), Age range=27–89 | 12/23 (52.2%) moderate condition, 9/23 (39.1%) severe, 2/23 (8.7%) critical | 15/23 (65.2%) asymptomatic, 8/23 (34.8%) mild to moderate condition | 4–38 | 1/23 (4.3%) | 2/23 (8.7%) fatalities from coronary disease and lung disease, 1/23 (4.3%) had cardiac arrest, 5/23 (21.7%) continue isolation and care |
| Deng et al, 2020, China | 61/576 (10.6%), Age range=≤29–79 | 38/61 (62.3%) mild condition, 20/61 (32.8%) moderate, 3/61 (4.9%) severe | 38/61 (62.3%) asymptomatic, 23/61 (37.7%) mild to moderate condition | Not Reported | 24/61 (39.3%) | 22/61 (36.1%) remained hospitalized |
| Yuan et al, 2020, China | 25/172 (14.5%), Age range=≤14–60 | 25/25 (100%) mild to moderate condition | 25/25 (100%) mild condition | 7.32 ± 3.86 | Not Reported | No fatalities |
| Lafaie et al, 2020, France | Case reports (n=3), Age range=84–90 | 3/3 (100%) severe condition | 3/3 (100%) severe condition | 12->30 | 3/3 (100%) | 3/3 (100%) fatalities |

elderly or had comorbidities. The timing of the 2nd positive test by PCR from the 1st ‘clinical cure’ was 4–38 days. In studies that measured antibody response, variance was observed in antibodies detected during the 2nd episode: some had IgG and IgM, some IgG only, and some had undetectable antibodies (Batisse, Loconsole, & Mei studies).

Conclusions Our review suggests that COVID-19 recurrence can rarely occur. The 2nd episode was more severe in high risk patients, and more likely due to reactivation or lack of recovery from the 1st infection rather than a reinfection. To prevent recurrence, close follow-up needs to be ensured upon discharge. Whether the severity of the 2nd episode is due to immune response, host factors or viral clearance needs to be evaluated in larger studies.

37

AN OBSERVATIONAL STUDY OF COVID-19 IN A PUBLIC ACADEMIC MEDICAL CENTER

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10.1136/jim-2021-WRMC.37

Purpose of Study Symptomatic patients presenting to Kern Medical were evaluated for clinical characteristics and severity.

The study includes symptomatic patients seen at Kern Medical.

Methods Used The Institutional Review Board approved as minimal-risk research. Consecutive patients (age ≥ 18 years) with confirmed SARS-CoV-2 infection between March 13 and July 15, 2020 were included. Inmates, pregnant females and persons < 18 years were excluded. Data extracted includes demographics, baseline comorbidities, smoking status, clinical presentation, routine laboratory tests, inflammatory markers, radiographic features, treatment and outcomes.

Summary of Results 420 confirmed cases with SARS-CoV-2, including 312 (74%) ambulatory care and 108 (26%) hospitalized patients were included. Average age (n = 420) was 47 years. 53% were females. Average BMI was 33.5. Ethnicity/race comprised of 83% Hispanics, 14% Caucasian and 5% African American. There were no observed differences between the rate of hospitalization and death based on ethnicities and smoking status. Compared to outpatients, inpatients were older (average age: 54 vs 41 years). Inpatients had more underlying chronic conditions (median = two) compared to outpatients (median=one) (diabetes, cardiovascular disease and chronic respiratory disease). Symptoms and outcomes are displayed in tables 1 and 2.

Conclusions This study confirmed previous observations that underlying comorbidities are associated with an increased

Abstract 37 Table 1 SYMPTOMS

| | INPATIENT (n=108) | OUTPATIENT (n=312) |
|---------------------|-------------------|--------------------|
| FEVER | 79% | 68% |
| COUGH | 80% | 68% |
| SHORTNESS OF BREATH | 81% | 32% |
| DYSGEUSIA | 7% | 14% |
| ANOSMIA | 4% | 12% |
| DIARRHEA | 18% | 18% |

Abstract 37 Table 2 Inpatient outcomes (n=108)

| | |
|------------------------|----------|
| ICU | 46 (43%) |
| MECHANICAL VENTILATION | 26 (24%) |
| DEATH | 19 (18%) |

risk of admission and death. Limitations include retrospective design and incomplete data. It appears that compared to the population we serve, Caucasians (37%) and AA (10%) are underrepresented and Hispanics (61%) are substantially overrepresented. The reasons for this are not evident.

38 MOBILE HEALTH CLINICS TO COMBAT THE SPREAD OF COVID-19 IN MIGRANT FARMWORKERS OF SKAGIT COUNTY, WASHINGTON

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Purpose of Study In Skagit County, the Hispanic community has been disproportionately affected by the COVID-19 pandemic. One particularly vulnerable group is the essential farmworkers who not only face the disease itself, but many socioeconomic challenges with it. Thus, there is great need for improved outreach to this population.

Methods Used A strength-based, asset-focused community assessment was performed using personal interviews with staff at Sea Mar, a community health clinic (CHC) serving low-income Latinx patients. Local organizations that offer additional assistance to the community were identified during these interviews. One group that provides COVID-19 related assistance to the Latinx community was interviewed and two meetings attended. Follow-up conversations and a literature search was then conducted.

Summary of Results In June 2020, it was found that 60% of Skagit County COVID-19 cases were from the Hispanic community, despite their making up just 18.6% of the population. In response, the Latinx COVID Prevention Team (LCPT), a coalition of 20–40 organizations, was formed. The LCPT meets weekly to discuss new challenges faced by the community. They also organize free events for the community and periodically communicate with Sea Mar regarding migrant farm worker (MFW) testing. Sea Mar utilizes their MHC to

provide COVID-19 testing and education at farms for Latinx workers using Mixtec and Spanish interpreters. In a literature review of MHCs for MFWs, it was found that MHCs create safe spaces for MFWs that promote trust in the healthcare system.

Conclusions A strength-based framework centers both the community's assets and needs, identifying what resources the community has and where to put them. During this pandemic, Skagit County Sea Mar has outfitted their MHC to provide COVID-19 testing and education to MFWs. Two improvements could be made to the current framework: (1) LCPT staff on site could directly offer legal and food assistance to MFWs and (2) MHC staff could share information about LCPT's free community events with MFWs. This community partnership would further reduce barriers to care, address social determinants of health, and provide awareness of COVID-19 related programs for Skagit County Latinx farmworkers.

39 EFFECTIVENESS OF CONVALESCENT PLASMA THERAPY IN CORONAVIRUS DISEASE 2019 (COVID-19) CASES

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10.1136/jim-2021-WRMC.39

Purpose of Study The purpose of this literature review is to assess the effectiveness of convalescent plasma therapy in patients with critical or severe illness due to COVID-19.

Methods Used A literature review was conducted through PubMed, Google Scholar, and Sci-Hub databases using keywords: 'convalescent', 'plasma', 'COVID-19', 'coronavirus', 'therapy', and 'treatment'. Only studies that evaluated more than 20 patients with a convalescent plasma therapy (CPT) group and a separate control group (no plasma therapy) were included in our literature review.

Summary of Results A total of 6 studies published before August 7, 2020 matched our inclusion criteria (table 1). Majority of the studies did not show a significant difference in mortality rate between the CPT and control group but a few studies showed some clinical improvement in the CPT group. The studies that evaluated viral load, showed decreased viral load in the CPT group soon after start of therapy. There were variations in the disease duration and dosage of plasma used among the participants. The time of administration of CP from symptom onset varied from 4 to 54 days, with the most significant improvements observed with earlier rather than later administration. The other medication used for the participants were variable, which could possibly confound the certainty of the actual effectiveness of the convalescent plasma therapy on patient outcomes.

Conclusions Our literature review indicates the potential of convalescent plasma as a COVID-19 treatment, especially in severe cases. But further studies are needed to determine the optimal dose, including antibody compositions as well as the timing of its administration in relation to the disease course.

Abstract 39 Table 1 Use of convalescent plasma in COVID-19 patients

| First Author, Location, type of study | Number, Age range | Intervention (CPT), N | Control (no CPT), N | Range/Mean/Median # of days (Symptom onset to Transfusion) | Were baseline Characteristics Intervention vs. Control the same? * | Outcomes Measured: Intervention vs. Control |
|--|----------------------|-----------------------|---------------------|--|---|--|
| Zeng et. al. China, Retrospective | N=21, Age: 31–79 y/o | 1–3 doses of CPT, N=6 | N=15 | Range: 17.8–23 Median: 21.5 | Yes | Viral Clearance: 6/6(100%) vs. 4/15(26.7%) p=0.004; Hospital stay 45.5 days vs 31 days p=0.03; Death: 5/6 (83.3%) vs. 14/15(93.3%) p=NS |
| Li et al. China, Prospective | N=103, 62–80 y/o | 1 dose of CPT N=52 | N=51 | IQR: 22–39 Median: 27 | Yes | Clinical improvement within 28 days: 27/52(51.9%) vs. 22/51(43.1%) p=NS. Severe disease: 91.3% vs. 68.2% p=0.03, Life-threatening disease: 20.7% vs. 24.1% p=NS. Rates of negative viral PCR: 24hr: 44.7% vs. 15% p= 0.003. No significant difference between two groups for 28-day mortality. |
| Abolghasemi et. al. Iran, Prospective | N=189, ≥18 y/o | 1 dose of CPT, N=115 | N=74 | | Yes | Discharged: 98 (98.2%) vs. 56 (78.7%) p |
| Xia et. al. China, Retrospective | N=1,568, 53–73 y/o | 1 dose of CPT, N=138 | N=1430 | Median: 45, IQR: 39–54 | Intervention group was older, had higher% of diabetics, and disease severity. | Mortality rate: 2.2% vs. 4.1%. Post-study ICU admission: 2.4% vs. 5.1%. Discharged: 87.7% vs. 95.5%. Hospitalization: 10.1% vs. 0.3% |
| Rasheed et. al. Iraq, Prospective, (Preprint) | N=49, | 1 dose CPT, N=21 | N=28 | Mean: 14.8, Range:4–28 | Yes. Comorbidities not included | Recovery Time from Critical Illness (RTCI): 4.52 vs. 8.45 days p<0.05 |
| Gharbharan et. al. Netherlands, Prospective (Preprint) | N=86, 55–77 y/o | 1 dose CPT, N=43 | N=43 | Median: 9, IQR: 7–13 | Yes | No significant difference in mortality, hospital stay and day-15 disease severity |

* Baseline characteristics include age, severity of illness, co-morbidities, other antiviral and antibiotics treatments IQR=Interquartile range

Healthcare research II – learning

Concurrent session

9:05 AM

Friday, January 29, 2021

40 TEACHING CAREGIVERS TO IDENTIFY RESPIRATORY DISTRESS USING DIFFERENT MODES OF EDUCATION

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10.1136/jim-2021-WRMC.40

Purpose of Study To compare two modes of education in teaching caregivers to identify respiratory distress in children 3 years old and younger.

Methods Used We enrolled 116 caregivers who brought a patient between the ages of 0–3 years to the University of New Mexico Pediatric emergency department. Exclusion criteria were: caregivers of children who presented with a chief complaint of cough or had a history of a respiratory or congenital heart condition. Prior to the intervention, caregivers were shown 8 video clips of children and asked to state if each child was breathing normally. This was followed by a randomized educational intervention. Caregivers were either shown 1) a video of a physician explaining breathing patterns found in respiratory distress (verbal group) or, 2) a video that showed the same explanations with supplemental visual examples (visual group). We assessed learning through a post-test featuring 8 new clips of children breathing normally or abnormally.

Summary of Results Pre-intervention, the verbal group scored higher (87.5% correct) than the visual group (78.2% correct) in identifying whether children were breathing normally (p=0.0002). Both the verbal (0.00013) and visual group (0.046) were better at identifying abnormally breathing children than those breathing normally. The total proportions of correct answers for the post-test videos were lower in both groups. The verbal group declined significantly in the post-test video clips (from 87.5% to 79% correct, p=0.0006), but the visual group declined less (78.2% to 75.5% correct, p=0.4), and their performance was comparable to that of the verbal only group (p=0.22). Consistent with the pre-test videos, abnormally breathing children were more easily identified in the post-test videos (verbal group, p=0.037; visual group, p=0.00001).

Conclusions Our results suggest that mode of education impacts a caregiver's ability to identify respiratory distress in children. We found that pairing verbal education with video images of abnormally breathing children was associated with improved recognition of abnormally breathing children but not of normally breathing children.

41 STUDENT PERSPECTIVE OF TEAM DYNAMICS BEFORE AND AFTER A DISASTER RESPONSE COURSE

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10.1136/jim-2021-WRMC.41

Purpose of Study We need to understand the COVID-19 pandemic impact on healthcare students. Loma Linda University requires an annual Critical Incident Response Course for graduating students about the importance of interprofessional

teamwork in a disaster response. We surveyed students about the pandemic impact on their lives.

Methods Used This is a mixed methods multidisciplinary cohort study of healthcare students (n=442). The 2020 course consisted of asynchronous content (eight hours) and a synchronous virtual meeting (two hours) focusing on triage, disaster simulation, and interprofessional teamwork. Students completed a pre/post survey on the COVID-19 pandemic response. We report both descriptive statistics and qualitative results from two independent coders.

Summary of Results Respondents included Medicine (n=149), Nursing Undergraduate (n=169), Nursing Graduate (n=16), Pharmacy (n=45), Dentistry (n=58), Other (n=5). Inter-rater reliability for coded answers exceeded, $\kappa=0.827$ (Cohen's kappa analysis). Students reported observing examples of efficient teamwork (77%) compared to 42% reporting inefficiencies. The most common efficiency was Mutual Support/Collaboration (50%) and the least reported was Team Structure (6%). Most common inefficiency was communication (41%) and the least was adaptability (4%). Students believed their profession will be different after COVID-19 (76%). The most reported anticipated change was Disaster Preparedness/Infection control (59%). Post-coursework survey showed 55% reported a stronger understanding of their profession's impact on disaster management. Individuals reported changing behavior during the pandemic (84%). The biggest change was in sleep: 15% reported a decrease and 41% reported an increase, followed by connecting with people (21% decrease, 39% increase). The biggest unmet need was Money (27%). The most helpful resources were Friends/Family (89%) and Social Media (43%). 34% volunteered or worked at an essential workplace.

Conclusions Healthcare students reported that communication, mutual support, and understanding one's interprofessional contribution are the core of fighting a pandemic. Healthcare students have unique challenges and resource requirements during a pandemic.

42 A QUALITY IMPROVEMENT PROJECT IMPACTS RESIDENT SATISFACTION WITH THE DEPART PROCESS

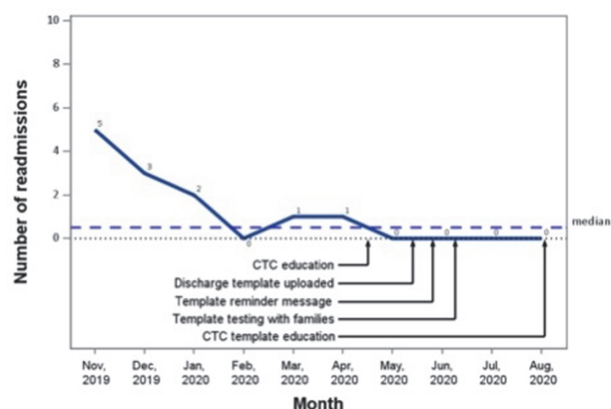
K Upplegger*, M Heubeck, L Lopez, A Subbaswamy, G McCauley, T Ozechowski, A Belmonte, R Craig, A Duran, K Fath, S Lunderman, E Jimenez. *University of New Mexico Health Sciences Center, Albuquerque, NM*

10.1136/jim-2021-WRMC.42

Purpose of Study The current depart process resulted in slow work-flow and patient safety and equity concerns. The QI project aimed to improve resident satisfaction with the hospital discharge process.

Methods Used The QI project was designed using the Model for Improvement. Starting April 2020, Plan-Do-Study-Act cycles included: hiring clinical team coordinators; creating standard depart instructions for diabetic ketoacidosis, pyelonephritis, seizures, croup and dehydration; uploading instructions to Powerchart; and clinician reminders to use instructions with families. Measures examined monthly, included resident satisfaction and patient readmissions.

Summary of Results Resident satisfaction improved from 4.8 (February 2020) to 7.8 (August 2020) for the overall discharge process; from 5.3 to 7.9 for family education on all key points; from 6.0 to 7.7 for smooth transition of care; from 3.0 to 7.4 for no language barriers; and from 3.0 to



Abstract 42 Figure 1 Run chart for readmissions of pediatric patients diagnosed with diabetes

6.7 for no unnecessary delays, on a scale of 0/strongly disagree/terrible to 10/strongly agree/excellent. Readmissions also trended downward.

Conclusions During this QI project to address the depart process, resident satisfaction improved and readmissions declined. These results are encouraging, but should be interpreted in the context of decreased patient census due to COVID-19 and non-respiratory season, which may have decreased workload and increased education time and interpreter access. Next steps include PDSAs related to health literacy and Spanish translation.

43 A UNIVERSITY COLLABORATION IN CREATING A POWERED AIR PURIFYING RESPIRATOR: AN EMERGENCY INNOVATIVE RESPONSE

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10.1136/jim-2021-WRMC.43

Purpose of Study In March of 2020, the World Health Organization declared the coronavirus (COVID-19) a global pandemic. As the number of cases increased worldwide, existing hospital infrastructure struggled to keep up with the demand for equipment and supplies. This exposed healthcare workers to contracting the disease. The purpose of this study is to demonstrate an emergency innovation response in overcoming shortages of personal protective equipment within a university hospital setting, with a special focus on powered air purifying respirators (PAPRs).

Methods Used The Center for Medical Innovation (CMI)—a center designed to promote research and development of high-impact healthcare products at the University of Utah (UofU)—enlisted university engineers to develop an open source PAPR system made from readily available commercial materials. Parts were selected to meet filtration, airflow, and protection specifications as outlined by industry standards. Commercially available parts consistent with these specifications were assembled into a novel PAPR system which utilized 3D printed pieces on demand to achieve compatibility. Once assembled, each PAPR went through protection testing to demonstrate health worker safety. A fit factor of 200 is the minimum requirement needed as defined by NIOSH. Testing

procedures were carried out with industry standard equipment.

Summary of Results A human centered design approach was utilized in iterating versions of the product based on repeated fit testing. Failures were addressed in subsequent models. All PAPRs passed fit testing with a score of > 1000. Following the lean processing standard of just in time inventory, materials to fabricate 1000 PAPRs were procured and assembled on demand. PAPRs are now being used by the UofU Hospital as well as other affiliate entities globally and are filling the gap needed for PPE. Approximately 200 units have been donated to Navajo Nations hospitals in the state of Utah and others have been donated to university sister entities in India, Nepal, and Kenya.

Conclusions The Center for Medical Innovation at the University of Utah has facilitated a rapid emergency innovative response in filling the PPE needs locally and abroad by creating this open source accessible PAPER system.

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LEADERS IN WOMEN'S HEALTH: 2020 PROGRESS REPORT ON ADVANCING WOMEN'S HEALTH AND LEADERSHIP

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10.1136/jim-2021-WRMC.44

Purpose of Study The Leaders Empowering the Advancement of Diversity in Education, Research and Science (LEADERS) in Women's Health sought to determine if a focused approach in expanding endowed professorships and chairs in women's health subspecialties can reduce sex-based inequalities by promoting women's health and research. Currently, numerous disparities in women's health exist, notably in treatment of cardiovascular disease, chronic obstructive pulmonary disease and joint replacements.

Methods Used A survey was distributed to LEADERS members to assess the impact that endowed chairs or professorships have on advancing women's health through establishment of clinical women's health programs, research programs, impacted salary, academic achievements, national presentations and grant funding.

Summary of Results The LEADERS survey was completed by 26 members: 50% endowed chairs, 15% professorships, and 35% women's health national leadership roles. Administrative leadership, protected research time and national recognition were impacted in part or strongly by holding an endowed chair or professorship (67%, 52%, 80%, respectively). However, an endowed chair or professorship had little to no impact on salary, first authorship, National Institute of Health (NIH) grant funding or being a lead investigator (71%, 76%, 100%, 67%, respectively). Chairs and professorships had little to no impact on establishing a new clinical entity in 62% of respondents but leading a new curriculum in women's health and research was impacted through endowments in 50%.

Conclusions Endowed chairs and professorships help advance women's health through curriculum development. They also advance national recognition and amplify administrative and protected research time. However, salary, NIH funding, first authorship, and establishment of women's health clinical

programs have yet to be impacted. Further work needs to be done to understand how to strengthen the influence of an endowed chair or professorship to further advance women's health.

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A GLOBAL SURVEY OF PATIENT AND CAREGIVER EXPERIENCES THROUGHOUT CARE FOR DEVELOPMENTAL DYSPLASIA OF THE HIP

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10.1136/jim-2021-WRMC.45

Purpose of Study Diagnosis and treatment for developmental dysplasia of the hip (DDH) varies depending on severity, age at diagnosis, and professional opinion. Little is known about patient experiences globally. We aimed to characterize global patient and caregiver experiences during DDH care and to highlight family priorities.

Methods Used We collaborated with seven DDH outreach organizations to develop an online cross-sectional survey for DDH patients or their caregivers (>18 years old) globally. Participants were recruited through web media of collaborating organizations over 3 months. Descriptive statistics were used to analyze quantitative results. Qualitative content analysis was used to categorize open-ended responses.

Summary of Results A total of 739 participants completed the survey, representing 638 (86.3%) caregivers of DDH patients, and 101 (13.7%) patients. 386 (52.2%) patients received diagnosis by 3 months of age; mean age of diagnosis was 15.96 months (90% CI = 12.04,19.91). Out of 211 patients with DDH family history, 68 (32.3%) did not receive DDH screening. Out of 187 patients born breech, 82 (43.9%) did not receive DDH screening. In total, 36/94 (38.3%) patients with both family history and breech birth did not receive DDH screening. Most (696/730, 95.3%) participants reported treatment with brace, surgery, and/or closed reduction. In total, 144 participants reported more than one surgery; 82 reported three or more surgeries. Participants reported a range of 1–400 visits to health care professionals for DDH care across 1–66 years. Lack of information on treatment practicalities and timelines, along with emotional burden of diagnosis, were greatest challenges reported.

Conclusions Results show that DDH care can pose significant burden on patients and caregivers. Reliable public information is needed to support those affected. Global educational efforts are needed to raise awareness of DDH risk factors, signs and symptoms among care providers to improve identification, screening, and monitoring of at-risk children.

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IMPACT OF LABORATORY TEST COST AND BLOOD VOLUME EDUCATION ON RESIDENT TEST ORDERING HABITS

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10.1136/jim-2021-WRMC.46

Purpose of Study Campaigns such as Choosing Wisely® Canada have recently brought into consideration that a significant proportion of inpatient laboratory testing is

unwarranted, lowering the quality of care and increasing healthcare expenditures. Prior studies have shown reductions in non-specific test ordering through interventions that are labour intensive, costly, and conducted with notable reviews and audits. This study investigates how educational interventions on test costs and blood volumes (BV) impact internal medicine (IM) resident ordering habits independently of other management activities.

Methods Used Two independent four-week IM resident blocks were studied. After two weeks, cost and BV information for the 32 most commonly ordered tests were distributed through physical and digital pamphlets to residents during a 10-minute intervention. Resident surveys measuring importance, influence, and knowledge of the intervention information were conducted prior to the interventions and following the resident block. All tests ordered by the residents within the block were analyzed. The number of tests and blood collections ordered each day, normalized to patient volumes, were analyzed using an interrupted time series analysis.

Summary of Results There was no significant change in either the level ($p=0.23$) or the trend ($p=0.17$) of daily physician ordering rates between the pre- and post-intervention periods. An insignificant change was also observed for the level ($p=0.83$) and trend ($p=0.81$) of blood collection rates. Further, there was no observable difference in physician ordering rates between tests for which information was provided and tests for which information was not provided. Despite this, 74% ($N=34$) and 63% ($N=29$) of pre-intervention responses predicted that cost and BV information respectively would impact their ordering, while all post-intervention responses ($N=46$) stated that it had. Residents were unaware of the intervention information beforehand.

Conclusions A disparity between IM resident test ordering habits and their perceived impact of the intervention was observed. Education on cost and BV alone was not effective in changing resident test ordering habits. Effective methods for influencing resident ordering seem to require a reiterative emphasis on the importance of conscientious test ordering and additional systems to audit residents.

47 AUDIT OF MEDICATION RECONCILIATION FORMS

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10.1136/jim-2021-WRMC.47

Purpose of Study Medication Reconciliation (MedRec) is an important safeguard against medication errors and should be completed within 24 hours of admission to avoid delays in patient care. It involves reviewing outpatient medication history upon inpatient admission to ensure medication information is accurate and up to date. Verifiers (physicians, pharmacists, and nurses) conduct a Best Possible Medication History (BPMH) cross-referenced with a MedRec form generated by PharmaNet (province-wide database of all prescriptions dispensed from pharmacies in BC, Canada). If the Verifier is a pharmacist or a nurse, the MedRec form requires additional review by a Prescriber (physician). This study assesses barriers preventing MedRec form adherence by quantifying the data entered by Verifiers and Prescribers and evaluating the timeliness of the form's completion.

Methods Used Patient charts for those admitted to one ward at BC Children's Hospital (BCCCH) between 6 January - 9 March 2020 were reviewed. Fourteen fields were evaluated: Weight, Allergies, Verification (of medicines), Prescriber's Orders (home medicines, and new orders), five Verifier Identification items (Printed Name, Date, Time, Signature, Designation) and five Prescriber Identification items (Printed Name, Date, Time, Signature, and College ID#). Time of completion was calculated from admission to Prescriber Time.

Summary of Results 124 patient charts were reviewed and 84 MedRec forms were included in the analysis; 40 were excluded as 19 did not have a MedRec form and 21 were repeat reviews of the same admission. There were low rates of completion in the following categories: Weight (42%), Allergies (31%), Verifier Date (38%), Verifier Time (25%), and Prescriber Time (45%). In terms of timeliness, 29 forms were at least partially completed in 24 hours; however, only three forms were fully complete and reviewed by a Prescriber within 24 hours. There were no complete forms reviewed by both a Verifier and Prescriber.

Conclusions Verifiers and Prescribers have a low rate of completion in terms of information logging, as well as completing the form within 24 hours. More investigation is required on several fronts: why some variables are unrecorded; identifying obstacles deterring the timely completion of the form; and the possible relationship between the low rate of MedRec form completion and patient care/outcomes.

Morphogenesis and malformations

Concurrent session

9:05 AM

Friday, January 29, 2021

48 SCHIZENCEPHALY IN COLLAGEN TYPE IV VASCULOPATHIES: THE VASCULAR HYPOTHESIS AND IMPLICATIONS FOR MANAGEMENT

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10.1136/jim-2021-WRMC.48

Purpose of Study Schizencephaly involves a cleft in the brain extending from the ependyma to the pial surface. Although schizencephaly can arise from malformation syndromes (*SHH*, *ATP1A3*), increasing evidence suggests it may also arise from disruptive vascular events. Maternal Vit K deficiency and twinning are possible etiologies for vascular disruption, but heritable bleeding conditions may be the most important to identify.

Methods Used To examine the phenotypic spectrum of *COL4A1/2* and its role in schizencephaly, we analyzed all pre/postnatal cases reported to date and addressed several gaps in knowledge: 1) Are there subtle *COL4A1/2* phenotypes suggesting patients are being missed, 2) What are possible environmental triggers for intracranial hemorrhage, 3) Which medications may be associated with bleeding episodes? Here present 220 cases involving *COL4A1/2* from the literature.

Summary of Results We found that 90% of cases involve *COL4A1* and 10% *COL4A2*. 78% of the *COL4A1/2* cases

involved the CNS (e.g. schizencephaly, hemorrhage), 47% the eye (anterior chamber anomaly, keratoconus), and 15% the kidneys. Only 21% of cases were identified prenatally and the majority as children or adults. Here we identified 113 unique pathogenic variants; while only 20% of the variants were cataloged in ClinVar. Importantly, missense mutations affecting glycine residues of the Gly-X-Y triple helix occurred 82% of the time. Some individuals may present symptoms in only one organ system (e.g. ophthalmologic, renal), but complete organ system evaluation should be considered. We aggregated all data on reported triggers for brain hemorrhage and concurrent medications in verified *COL4A1/2* cases. We found 16 cases with reported medication use. Aspirin and warfarin were reported in those with and without hemorrhage. 14 cases described possible triggers ranging from vigorous exercise to sports.

Conclusions *COL4A1/2* conditions are diverse and potentially under-recognized. Since patients may be at risk for complications, early recognition and management is recommended. Further studies regarding natural history are needed for optimal medical recommendations.

49 INVESTIGATION OF ITGAM ON FRACTURE DEVELOPMENT AND VERTEBRAL MORPHOLOGY IN ZEBRAFISH

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10.1136/jim-2021-WRMC.49

Purpose of Study Recently the gene *ITGAM* was identified in a human GWAS as a frequently mutated gene in human patients with increased fracture rates. Our study aimed to investigate the role of *itgam* in a zebrafish model to better understand the morphologic changes this gene may contribute to as it relates to fractures and vertebral bone morphology.

Methods Used The *itgam* mutants were created via CRISPR/Cas9, had a 7 base pair deletion in exon 7 of the zebrafish *itgam* gene, and were bred to homozygosity. 13 homozygous (*itgam*^{-/-}) and 9 wildtype control (*itgam*^{+/+}) zebrafish clutchmates were compared. Genotyping of each fish was performed using tissue from caudal fin clips and each adult subject was scanned with microCT imaging at 136 days of age. Images were analyzed for qualitative effects such as observable fractures with Fiji ImageJ. Quantitative analysis of bone morphology was performed using FishCuT software and a custom R script to assess for patterns of difference in vertebral morphology (bone mineral density, volume, and thickness) at three different locations on each vertebra (centrum, haemal arch/ribs, and neural arch). Both analyses were performed blinded to genotype.

Summary of Results A nearly 2-fold increase in fracture prevalence was found in *itgam*^{-/-} fish (0.846 fx/subject) as compared to controls (0.444 fx/subject). Quantitative FishCuT analysis demonstrated that centrum total mineral density was significantly changed in the *itgam*^{-/-} group as compared to controls (p=0.022). In a secondary analysis, *itgam*^{+/+} fish were allometrically scaled to *itgam*^{-/-} fish to control for variation in bone development between groups. Following allometric scaling, there was no statistically significant change in any bone morphology measure between groups, although a trend of

decreased mineral density was seen in all vertebral locations in *itgam*^{-/-} fish.

Conclusions Our preliminary research of *ITGAM*, a novel gene associated with fractures in humans, reveals an increased prevalence of fractures in a zebrafish model without demonstrating specific morphologic changes within the vertebral column.

50 CHARACTERIZATION OF PATTERNED LIMB DEVELOPMENT: REGULATION OF THE FGF-SHH RECIPROCAL LOOP

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10.1136/jim-2021-WRMC.50

Purpose of Study Fibroblast growth factors (FGFs) secreted from the apical ectodermal ridge (AER) coordinate proximal-distal patterning, while sonic hedgehog (SHH) from the zone of polarizing activity (ZPA) directs anterior-posterior growth of the limb. These signaling centers maintain each other's expression in a reciprocal feedback loop; however, the molecular intermediates involved are only partially characterized. LIM homeobox 2 (*LHX2*) has been identified as an intermediate regulator downstream of FGF in the reciprocal loop. We have identified a *cis*-regulatory module (CRM) located upstream of the *LHX2* promoter that is active in the sub-AER *LHX2* expression domain. *In silico* analysis of this *LHX2*-associated sub-AER regulatory module 1 (*LASARM1*) revealed several putative E26 transformation-specific (ETS) binding sites. We identified three ETS binding sites within *LASARM1* and hypothesized that mutation of one or more of these sites would disrupt FGF-mediated enhancer activity.

Methods Used To determine whether the ETS transcription factor binding sites contribute to *LASARM1* activity, we performed site-directed mutagenesis on the ETS sites within a *LASARM1*-reporter construct. We then used targeted regional electroporation (TREP) to transfect chicken limb buds and evaluate modified *LASARM1* constructs. After 24 hours of incubation, *LASARM1* activity was determined by fluorescence microscopy.

Summary of Results Mutation of all three sites ablated *LASARM1* activity in the distal mesoderm of Hamburger-Hamilton stage 24 chicken limb buds.

Conclusions Our findings suggest that FGF signaling utilizes ETS transcription factors to regulate *LHX2* expression through the *LASARM1* enhancer.

51 RECESSIVE ARTHROGRYPOSIS AND PROGRESSIVE LEUKODYSTROPHY: LINKING NEONATAL AND ADULT PHENOTYPES OF GBE1

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10.1136/jim-2021-WRMC.51

Case Report Arthrogyrosis conditions are diverse and sometimes distinctive. Central nervous system involvement is seen in up to 25 percent of patients. Biallelic variants in *GBE1* gene, affecting the glycogen branching enzyme, cause a severe neonatal arthrogyrosis, glycogen storage disease (GSD-IV) with infantile-onset progressive liver cirrhosis, or adult polyglucosan body disease (APBD), an adult-onset

neurodegenerative disorder with leukodystrophy. Herein, we report a novel combination of *GBE1*-pediatric and adult phenotypes.

We evaluated a 26-year-old man with Klippel-Feil anomaly and arthrogryposis affecting his upper extremities since birth. Contractures of bilateral shoulders, elbows, and fingers were noted on exam. He completed school without difficulty. Two years prior to presentation, he was hospitalized for acute psychosis. His behavior continued to be complicated by episodes of disorganized thought, hallucinations, social withdrawal, and food aversion. Dilated eye exam and laboratory tests including liver function tests were unrevealing. Electrodiagnostic studies demonstrated a sacral radiculopathy. Brain MRI showed diffuse supratentorial and infratentorial leukodystrophy, sparing U-fibers. Exome sequencing identified compound heterozygous variants in *GBE1*: a likely-pathogenic c.1597G>A (p.E533K) variant and a pathogenic c.691+2T>C canonical splice site variant. We also reviewed the literature on *GBE1* but we were only able to identify one other pediatric case with arthrogryposis involving the upper limbs, similar to our patient.

We highlight here the phenotypic continuum of *GBE1*-related disorders. The musculoskeletal subtype of GSD-IV has been reported in neonates with fetal akinesia and arthrogryposis multiple congenita with perinatal lethality. Abnormal muscle biopsies showing polyglucosan bodies in musculoskeletal GSD-IV, as well as the presence of leukodystrophy in APBD, suggests myogenic and/or neurogenic etiologies underlying the development of arthrogryposis. Further enzyme activity in fibroblasts and testing in family members is recommended, and the risk for white matter disease/leukodystrophy is important to consider in individuals who are tested. We propose that *GBE1*-related conditions should be considered in patients presenting with arthrogryposis.

52 A NOVEL PANCREATIC PHENOTYPE IN A CHILD WITH *WDR19*-RELATED CILIOPATHY

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10.1136/jim-2021-WRMC.52

Case Report Ciliopathies are a group of genetic disorders caused by ciliary dysfunction. *WDR19* is one member of the nephronophthisis (NPHP)-related ciliopathy gene family. *WDR19* mutations manifest various phenotypes that involve the kidneys, liver, retina, and ectodermal structures. We describe a 5-year-old female with a complex phenotype that does not fit into the previously described *WDR19*-related ciliopathies.

A 5-year-old female was born at 39 weeks gestation following an uncomplicated pregnancy. She presented at 10 days old with respiratory distress, weight loss, metabolic acidosis, elevated transaminases and creatinine. She progressed to end stage renal disease (ESRD) requiring peritoneal dialysis (PD) by age 1. She had hypotonia, developmental delay, feeding intolerance, wheezing, short-limbed short stature and small thorax. Skeletal survey demonstrated a short rib thoracic dysplasia. Despite bilateral chest wall reconstruction, she was ventilator-dependent by age 3 due to mixed restrictive and obstructive lung disease. She had recurrent pancreatitis complicated by pseudocysts requiring surgical drainage and drain

placement. Liver and pancreas biopsies showed intrahepatic bile duct dilation with portal fibrosis, small pancreatic mesenteric cysts with focal cystic duct dilatation and strictures. Whole exome sequencing (GeneDx) showed 2 likely pathogenic *WDR19* variants *in trans* (maternally-inherited: c.742G>A, p.G248S; paternally-inherited: c.617T>C, p.L206P). She is awaiting kidney, liver and pancreas transplantation.

This patient with *WDR19* mutations displays many features consistent with NPHP-related ciliopathies including renal disease, hepatic fibrosis and skeletal dysplasia. However, her phenotype does not fit neatly into the *WDR19*-related syndromes. Particularly her severe pancreatic involvement has not been previously described. Although her pancreatitis was initially thought related to PD, the ongoing and severe pancreatic disease with pseudocysts suggests her underlying disorder is causative. This patient illustrates one of the many phenotypes resulting from *WDR19*-related ciliopathy, and adds pancreatitis to the spectrum of problems that can be seen.

53 5TH DIGIT NAIL HYPOPLASIA IN TRISOMY 9P

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10.1136/jim-2021-WRMC.53

Purpose of Study Fifth digit nail hypoplasia is a feature that is thought to be pathognomonic for Coffin-Siris syndrome. Multiple single gene mutations associated with Coffin-Siris syndrome affect subunits of the ATP-dependent chromatin remodeling complex BAF, which is crucial for the regulation of gene expression. We present a case of 5th digit nail hypoplasia in trisomy 9p and hypothesize that genes on 9p influence digit development, and that trisomy 9p should be included in the differential diagnosis for patients with 5th digit nail hypoplasia.

Methods Used Chart review, physical exam, and literature review.

Summary of Results We describe a 4 day old girl with hypotonia, dysphagia, pulmonary hypertension, ASD, bicuspid aortic valve, transverse arch hypoplasia, and microgyri. Exam demonstrated hypertelorism with telecanthus and prominent nasal root. Extremity exam was notable for bilateral 5th distal phalanx hypoplasia with significant 5th fingernail hypoplasia. She also had nail hypoplasia of index fingers and of all toes, most prominently noted on the 5th toes. Postnatal karyotype showed an abnormal female karyotype with a derivative of chromosome 18 resulting from an unbalanced translocation of chromosome 9p13 distal segment onto 18p11.2. This resulted in a terminal deletion at 18p11.2 (18p deletion) and terminal gain at 9p13 (trisomy 9p). A microarray was obtained to delineated breakpoints and demonstrated copy number gain from 9p24.3 to 9p11.2, and copy number loss from 18p11.32 to 18p11.21.

Conclusions Although 5th fingernail hypoplasia is thought as pathognomonic for Coffin-Siris syndrome, we have demonstrated that this feature can also be found in other conditions. Others report nail hypoplasia and digit anomalies in trisomy 9p, and we predict that the nail hypoplasia in our patient is due to trisomy 9p. There are currently no reported genes associated with Coffin-Siris syndrome located on chromosome 9p. However, given that there is some clinical overlap between trisomy 9p and Coffin-Siris syndrome, it is possible

that there are genes on 9p that impact the BAF complex. Trisomy 9p should be included in the differential diagnosis of individuals with 5th fingernail hypoplasia.

54 A CASE OF NON-FINNIISH MULIBREY NANISM

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10.1136/jim-2021-WRMC.54

Purpose of Study Mulibrey nanism (MN) is a rare autosomal recessive syndrome affecting the muscle, liver, brain, and eye. Of 150 worldwide reports, 110 describe Finnish MN. Non-Finnish MN (nFMN), which has been noted to consistently present with cardiac involvement, is exceedingly rare. Herein, we report a case of a 3-year-old Afghan boy fulfilling clinical criteria for Russell-Silver syndrome who presented with anasarca. He was found to have refractory hypoalbuminemia, hepatomegaly, constrictive pericarditis, hypogammaglobulinemia, and T-cell lymphopenia. Extensive workup did not yield a satisfactory explanation for his problems, and parental fourth-degree consanguinity raised concern for a hereditary disorder. The patient's 4 siblings were healthy, and there was no family history of growth delay.

Methods Used Rapid whole genome sequencing (rWGS) was performed, and variants were identified with the Illumina DRAGEN Bio-IT Platform. Gene burden was overlapped with the patient's phenotype. Structural variants were filtered for coding regions of known disease-associated genes and with allele frequencies <2% in an internal database. Comprehensive review of published literature on MN was completed.

Summary of Results A ~45kb homozygous deletion located at 17q22 and encompassing exons 3–16 of the *TRIM37* gene was identified. Deletions involving *TRIM37*, which encodes peroxisomal Ubiquitin E3 ligase, are an established cause of MN. To our knowledge, this variant has not been previously reported or functionally characterized in literature.

Conclusions A novel variant in *TRIM37* was identified by rWGS in a nFMN patient formerly carrying a diagnosis of Russell-Silver syndrome. While many of the patient's symptoms, such as failure to thrive, ascites, hepatomegaly, constrictive pericarditis, and hypogammaglobulinemia, have been previously associated with MN, hypoalbuminemia and T-cell lymphopenia have not. This case expands the phenotype of nFMN and highlights the importance of rWGS in securing a diagnosis in the setting of an atypical presentation of a rare disorder.

55 THE ROLE OF THE SOX11 TRANSCRIPTION FACTOR IN REGULATING GROWTH DIFFERENTIATION FACTOR-5 DURING JOINT FORMATION

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10.1136/jim-2021-WRMC.55

Purpose of Study Growth differentiation factor 5 (GDF5) has been associated with the formation and maintenance of joints. Disruption of *GDF5* expression has also been linked to accelerated osteoarthritis. We have identified a *GDF5* Associated Regulatory Region (GARR) that contains several Sox binding

sites. The *SOX11* transcription factor has been shown to upregulate *GDF5* and we hypothesized that *SOX11* is necessary for GARR mediated expression of *GDF5* during in joint development and maintenance.

Methods Used To test this hypothesis, we compared the expression of *SOX11* and *GDF5* in chicken limbs during development using *in situ* hybridization. We also generated a GARR reporter construct and mutated the Sox binding sites. The native and mutated GARR reporter was transfected into developing chick wings. We also co-transfected a *SOX11* expression vector with GARR in ectopic, but joint-related sites.

Summary of Results Our results showed that in chicken, *SOX11* expression overlaps *GDF5* expression in joint spaces (elbow and fingers) at Hamburger-Hamilton stages (HH) 25–27. The *SOX11* expression primarily surrounded that of *GDF5*. At HH 29–35, the expression of *SOX11* and *GDF5* colocalized in joint spaces. However, the expression of *SOX11* was not confined to joints but also colocalized with MyoD, a muscles (MyoD expression) marker, and tendons (as well as TNMD expression). Disruption of the Sox binding sites greatly reduced GARR activity within joint spaces. Co-transfection of GARR and a *SOX11* expression vector demonstrated increased GARR activity.

Conclusions We conclude that GARR is active within joint spaces, and the colocalization of *SOX11* and *GDF5* in joints supports the hypothesis that *SOX11* may play a role in the regulation of *GDF5* through GARR. Additionally, it may be a competency factor for the formation and organization of joint-related tissues like muscles or tendons. Our data further suggests that *SOX11* is required for GARR activity and ectopic expression can enhance its activity. Further experiments are needed to clarify the role of *SOX11* in regulating joints and joint associated tissues.

Neonatology general I

Concurrent session

9:05 AM

Friday, January 29, 2021

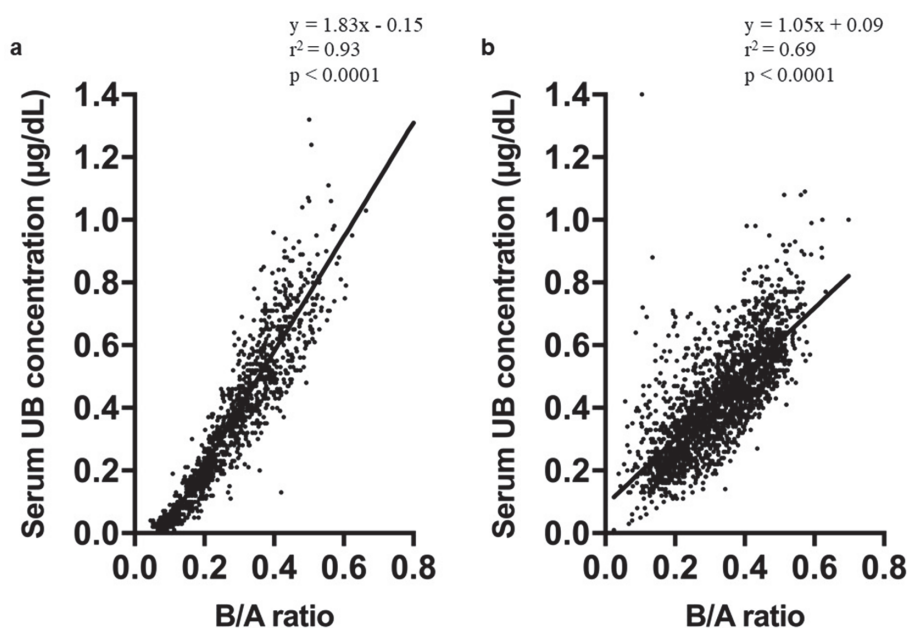
56 DO BILIRUBIN/ALBUMIN (B/A) RATIOS CORRELATE WITH UNBOUND BILIRUBIN LEVELS IN PRETERM INFANTS?

¹S Abe*, ¹K Fujioka, ²RJ Wong, ¹K Iijima. ¹Kobe University Graduate School of Medicine, Kobe, Japan; ²Stanford University School of Medicine, Stanford, CA

10.1136/jim-2021-WRMC.56

Purpose of Study A strong correlation between the bilirubin/albumin (B/A) ratio and unbound bilirubin (UB) levels in newborns ≥ 35 wks' of gestation has been reported previously. However, in preterm infants, the usefulness of B/A ratios is unclear.

Methods Used We obtained serum samples from 381 newborns < 35 wks' of gestation, who were admitted to Kobe University Hospital from 2014 to 2018. UB levels were measured using the glucose oxidase-peroxidase method. Total serum/plasma bilirubin (TB) and albumin (Alb) concentrations were measured spectrophotometrically. We stratified the samples



Abstract 56 Figure 1 Correlation of the B/A ratio and serum UB levels in (a) non-irradiated, and (b) irradiated samples

into two groups based upon phototherapy use. B/A ratios were calculated and correlated with UB levels. The samples from infants not treated with phototherapy were then stratified by gestational age (GA) epochs: 22–27, 28–29, 30–31, and 32–34 wks of gestation, and B/A ratios correlated with UB levels.

Summary of Results B/A ratios significantly correlated with UB levels in samples from infants who never received phototherapy ($n = 1,250$; $y = 1.83x - 0.15$, $r^2 = 0.93$), when compared with samples from those who received phototherapy ($n = 2,039$; $y = 1.05x + 0.09$, $r^2 = 0.69$). When stratified by GA, the correlation remained.

Conclusions Even in preterm infants < 35 wks of gestation, B/A ratios strongly correlated with UB levels. Therefore, we conclude that B/A ratios can be used as an index of UB levels with high sensitivity and specificity in infants who never received phototherapy.

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INCREASING INCIDENCE OF ASTHMA IN CHILDREN WITH PRENATAL OPIOID EXPOSURE

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10.1136/jim-2021-WRMC.57

Purpose of Study Opioid use disorder (OUD) in pregnancy is an acknowledged public health crisis. An estimated 1 in 3 women of reproductive age filled an opioid prescription every year from 2008 to 2012 in the United States. Furthermore, the number of women admitted for labor and delivery with OUD quadrupled from 1999 to 2014. The impact on long-term outcomes for those exposed continues to be investigated. Given the proinflammatory state that results from Prenatal Opioid Exposure (POE), we hypothesized that infants with POE or Neonatal Opioid Withdrawal Syndrome (NOWS) diagnoses during the newborn hospitalization would have an altered immune reactivity that persisted into childhood, defined by asthma diagnosis by 8 years of age.

Methods Used A retrospective cohort design utilizing a comprehensive CERNER HealthFacts® U.S. national database was completed. ICD-9-CM and ICD-10-CM diagnosis codes identified infants born at term with known POE or NOWS and were compared to control infants with only normal newborn codes. This cohort was followed out to 8 years of age with ICD-9-CM and ICD-10-CM diagnosis codes for asthma queried to determine the incidence of asthma. Descriptive statistics of frequencies and percentages were calculated for all variables and a Chi-Square test was conducted to examine the relation between asthma diagnosis and POE/NOWS.

Summary of Results A total of 3,021 records were included in the analysis. Briefly, 47% of the infants were female and 50% of the infants were male; the remaining 3% was not specified. Roughly 42% of infants were on Medicaid and the vast majority of the participants (92.5%) were located in an urban community, with only 7.5% of the participants being located in a rural community. The odds of an infant developing asthma were two times higher for the group exposed to opioids prenatally (OR 2.0, 95% CI: 1.45–2.77) and this was statistically significant ($p < 0.0001$).

Conclusions These emerging results suggest infants with POE may have altered immune reactivity that not only impacts the newborn period but persists into childhood. Additional investigations are needed to further characterize the impact POE has on the developing immune system so that potential follow up strategies and interventions can be established.

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PERSISTENT BACTERIAL VAGINOSIS AND RISK FOR SPONTANEOUS PRETERM BIRTH

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10.1136/jim-2021-WRMC.58

Purpose of Study An association between first trimester bacterial vaginosis (BV) and spontaneous preterm birth (sPTB)

has been previously described. While up to 25% of BV cases are persistent, there is a paucity of data on the association between persistent BV and risk of sPTB. Our aim was to analyze the association between persistent BV and sPTB.

Methods Used A large commercial claims database, IBM MarketScan, was analyzed. A cohort of women with a singleton gestation was identified using International Classification of Diseases (ICD-9/10) codes and linked with outpatient medications data. Diagnosis of BV was based on the presence of BV ICD-9/10 codes and a prescription for Metronidazole or Clindamycin. Persistent BV was defined as BV requiring a prescription in both the first and second trimester, or BV requiring more than one prescription. sPTB was defined as PTB occurring after preterm premature rupture of membranes or preterm labor using ICD codes. Odds ratios (ORs) were used to estimate associations between BV and sPTB.

Summary of Results Among 2,538,606 pregnant women, 63,817 had an episode of BV. sPTB in women without BV was 5.7%, and 7.5% in those with BV (OR 1.33 (95% CI 1.29, 1.37)). Women with BV in both the first and second trimester had a slightly higher risk for sPTB (OR 1.66 (95% CI 1.52, 1.81)) than those treated in either the first (OR 1.42 (95% CI 1.36, 1.48)) or second trimester (OR 1.47 (95% CI 1.41, 1.53)) alone. Women with two prescriptions had (OR 1.35 (95% CI 1.26, 1.44)) similar risks for sPTB as those with only one prescription (OR 1.30 (95% CI 1.26, 1.35)). The risk was highest among those treated with 3 or more prescriptions during the course of the pregnancy (OR 1.48 (95% CI 1.35, 1.63)).

Conclusions BV in pregnancy is associated with an increased risk for sPTB. Women with persistent BV in both the first and second trimester, or those requiring 3 or more prescriptions had at least a 50% higher risk for sPTB than those without BV in pregnancy.

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EVALUATING VARIATIONS IN NEONATAL INTENSIVE CARE: LONGITUDINAL, POPULATION-BASED TRENDS IN CLINICAL MANAGEMENT AND CARE OF NEWBORNS IN CALIFORNIA

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10.1136/jim-2021-WRMC.59

Purpose of Study Identifying hospital and patient populations that are susceptible to variations in newborn management can inform potential overuse in neonatal intensive care unit (NICU) services and guide health equity measures. Recent investigations have suggested that there may be growing numbers and variation of NICU admissions nationwide, with an increasing number of neonates of higher gestational age, greater birth weight, and lower illness acuity receiving resource-intensive care. Given concerns of inefficient resource utilization, we aimed to elucidate whether these longitudinal trends in neonatal management were reflected in California.

Methods Used We evaluated NICU utilization in California from 2008–2018, comparing statewide data on live births and NICU admissions across gestational age and birth weight categories. We analyzed birth certificate data from the California

Children's Services (CCS) and hospital- and admission-level data from the California Perinatal Quality Care Collaborative (CPQCC), which capture >95% of all births and NICU admissions in California. Trends in live births and inborn admissions were analyzed with linear regression models over the study period.

Summary of Results Between the two linked datasets, we identified 474,750 inborn admissions and 3,972,494 live births, representing a 12% NICU admission rate across 146 hospitals. Among these admissions, 112,207 infants were born with high acuity medical needs, at very low birth weight, and/or at very premature gestational age. Yearly trends in live births and inborn admissions were not statistically significant ($p=0.145$ and $p=0.359$). However, admission of neonates with birth weight ≥ 2500 g varied when stratified by perinatal region ($n=11$), with different regions experiencing significantly increasing or decreasing rates of inborn NICU admissions over time ($p<0.001$).

Conclusions Nationwide trends of increasing NICU admissions are not reflected overall in California, with NICU admissions remaining constant over the past decade. A closer examination suggests that variations in care may be masked by broad-level analysis; further research is needed to reveal how these trends may differ across hospital- and infant-level characteristics.

60

ACCURACY OF TRANSCUTANEOUS CO₂ MONITORING IN NEWBORNS UNDERGOING THERAPEUTIC HYPOTHERMIA

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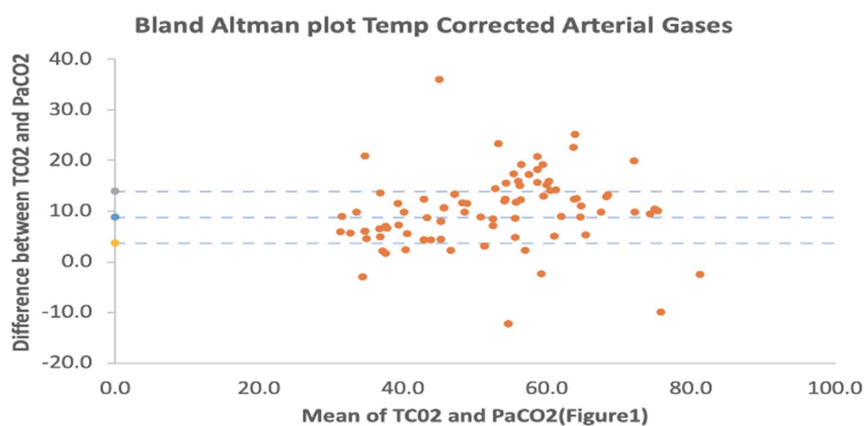
10.1136/jim-2021-WRMC.60

Purpose of Study Therapeutic hypothermia (TH) at 33.5°C is standard of care in infants with hypoxic ischemic encephalopathy (HIE). Carbon dioxide (CO₂) has a strong effect on cerebral blood flow and temperature corrected PaCO₂ < 35 mm Hg has been shown to lead to adverse neurological outcomes. Transcutaneous Carbon dioxide (TCO₂) monitor is a reliable non-invasive tool to measure continuous CO₂. We aim to study the accuracy of TCO₂ in newborns undergoing TH.

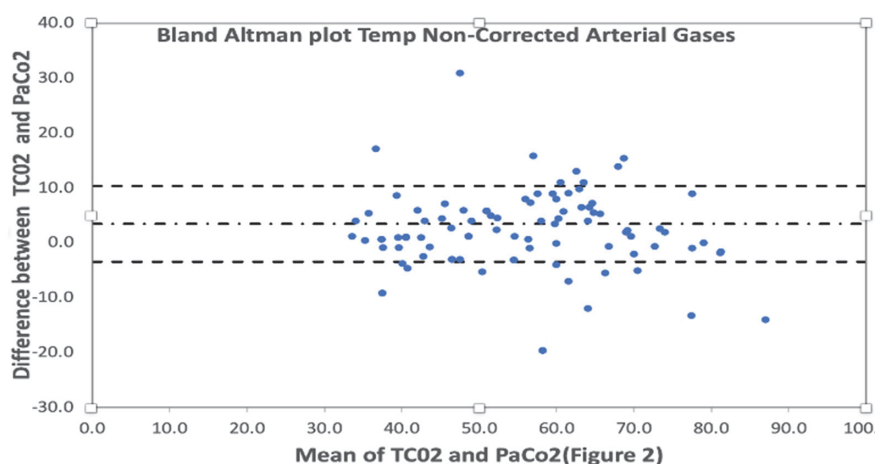
Methods Used Retrospective chart review of 10 neonates undergoing TH for HIE on respiratory support. Partial tension of arterial CO₂ (PaCO₂) was compared to simultaneously measured TCO₂.

Summary of Results Ninety-one PaCO₂ and TCO₂ pairs were available for analysis. Temperature corrected (Tc) and non-corrected (Tnc) PaCO₂ concentrations were compared to TCO₂. Tc PaCO₂ had a strong positive correlation with TCO₂ ($r=0.8$, $p<0.05$), but with a poor mean difference (95% agreement) of 8.8 (figure 1). Tnc PaCO₂ compared to TCO₂ showed a better mean difference (95% agreement) of 3.5 (figure 2) with a similar r of 0.8, $p<0.05$.

Conclusions Targeting corrected PaCO₂ during TH results in cerebral hyperemia and homogenous brain cooling. Transcutaneous CO₂ monitoring correlates better with uncorrected PaCO₂ possibly due to sensor skin warming. Incorporating a mathematical correction model to adjust TCO₂ to corrected PaCO₂ will increase cerebral blood flow and potentially improve outcomes.



Abstract 60 Figure 1 Tc PaCO₂ had a strong positive correlation with TC0₂ ($r = 0.8$, $p < 0.05$), but with a poor mean difference (95% agreement) of 8.8



Abstract 60 Figure 2 Tnc PaCO₂ compared to TC0₂ showed a better mean difference (95% agreement) of 3.5 with a similar r of 0.8, $p < 0.05$

61 SEVERE SMALL-FOR-GESTATIONAL-AGE INFANTS ARE EXPOSED TO INCREASED OXIDATIVE STRESS CONDITION

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10.1136/jim-2021-WRMC.61

Purpose of Study The purpose of this study was to clarify the oxidative stress levels at birth in severe SGA (birthweight less than -2 standard deviations (SD) for gestational age) and AGA infants.

Methods Used This study was conducted under the approval of the ethical committee of the Kobe University Graduate School of Medicine (approval number, 180083). The serum samples of 16 severe SGA and 17 AGA infants, who was born in our hospital during March 2017 to December 2018, were used in this study with parental consent. Oxidative stress (d-ROM; derivative of reactive oxidative metabolites) and antioxidant potential (BAP; biological anti-oxidant potential) were measured by using FREE Carrio Duo (WISMERLL), and then compared between the groups. Next, we defined 'increased oxidative stress condition' when the d-ROM exceeded the average value + 2SD for full-term AGA infants ($= 109.2$ U. CARR), and compared the frequency. Data are expressed as

the median (range) or mean \pm SD. The Student's t-test and Chi-square test were used to compare the data of severe SGA and AGA. Differences were deemed statistically significant for $p < 0.05$.

Summary of Results There was no significant difference in gestational age, rate of preterm infants, birth weight, Apgar score and umbilical artery blood pH between severe SGA and AGA infants, except significant lower birth weight SD ($p < 0.0001$) and higher lactate level ($p = 0.02$) in SGA children. To elucidate the effect of preterm birth, we have compared preterm and term AGA infants ($n=9$ and 8 , respectively), and found that no significant difference in d-ROM (preterm; 50.9 ± 54.9 , vs. term; 78.5 ± 11.7 U. CARR) and BAP (2323.1 ± 267.0 , vs. 2479.0 ± 152.1 uM) between the groups. Despite no significant difference found in BAP (SGA; 2602 ± 479 , vs. AGA; 2397 ± 229 uM), severe SGA infants showed significantly higher d-ROM levels (110.7 ± 75.2 , vs. 63.9 ± 42.0 U.CARR, $p=0.03$). The incidence of increased oxidative stress condition was significantly higher in severe SGA infants than in AGA infants ($8/16$ (50%) vs. $1/17$ (6%), $p=0.004$).

Conclusions While the effect of gestational age on oxidative stress is not significant, SGA infants were exposed to increased oxidative stress condition at birth.

62 INCIDENCE OF HYPOSPADIAS IN SEVERE SMALL-FOR-GESTATIONAL-AGE ASIAN INFANTS: A MULTICENTER POPULATION STUDY

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10.1136/jim-2021-WRMC.62

Purpose of Study To characterize the incidence of hypospadias in severe SGA [birthweight (BW) < -2 standard deviations (SD) of appropriate-for-gestational-age (AGA)] infants.

Methods Used This retrospective study was conducted under the approval of the ethics committee of the Kobe University Graduate School of Medicine (#170127). Records were reviewed for 592 SGA male infants who were admitted to one of 3 tertiary perinatal centers in Japan from 2008 to 2017. Infants with chromosomal anomalies (n=61) were excluded. Clinical data, such as GAs, BWs, BW Z-scores, Apgars at 1 and 5 min, and diagnoses of neonatal asphyxia (Apgar score ≤6 at 1 min) and hypospadias were collected from electronic medical records. Data are expressed as the median (range) or mean±SD. Mann-Whitney nonparametric rank and Chi-square tests were used to determine statistical significance (p<0.05).

Summary of Results Clinical characteristics of the hypospadias and non-hypospadias groups are shown in the table 1. BW Z-scores were significantly lower in infants with hypospadias than those without (p=0.002). The incidence of hypospadias in severe SGA infants was 6.4% (34/531) overall and 4.9%, 7.7%, and 5.5% for each center, which were not significantly different.

Abstract 62 Table 1 Clinical characteristics

| Characteristic | Hypospadias, n=34 | Non-Hypospadias, n=497 | p-value |
|-----------------|------------------------|------------------------|---------|
| GA, wks | 36 (27–40) | 36 (22–41) | 0.64 |
| BW, g | 1415 (452–2352) | 1750 (314–2720) | 0.16 |
| BW Z-score, SD | -3.03 (-5.96 to -2.01) | -2.65 (-4.67 to -2.01) | 0.002 |
| Apgars at 1 min | 8 (2–9) | 8 (0–10) | 0.19 |
| Apgars at 5 min | 9 (4–10) | 9 (1–10) | 0.18 |
| Asphyxia (%)* | 11/34 (32.4) | 134/497 (27.0) | 0.49 |

Data are expressed as median (range)

Conclusions Our data demonstrate a possible relationship between a higher risk of hypospadias with the severity of SGA. Therefore, further study is warranted to evaluate the relationships between SGA, testosterone levels, and hypospadias risk.

63 NEONATAL RESUSCITATION IN THE EMERGENCY ROOM: TESTING KNOWLEDGE AND CONFIDENCE OF RESIDENTS

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10.1136/jim-2021-WRMC.63

Purpose of Study Emergency Medicine (EM) residency training is a diverse discipline, encompassing many facets of adult and pediatric medicine. Currently, neonatal resuscitation program (NRP) training is not a required ACGME milestone. As neonatal cardiopulmonary compromise in the emergency department is rare, it is difficult for EM residents to learn and master the necessary skills to stabilize critically ill newborn infants.

Methods Used Our prospective interventional study assessed EM residents' knowledge and confidence in neonatal resuscitation skills. We randomized EM residents to receive a single baseline session (control) or two sessions 6 months apart (intervention) of high fidelity simulation training led by NRP instructors. All participants completed pre and post surveys and quizzes assessing their confidence and knowledge in implementing NRP guidelines. The study period was 10 months. A 5-point Likert scale was used.

Summary of Results A total of 48 (65%) residents representing all four postgraduate years enrolled in the study with 19 (39%) completing all components of the study. Importance of NRP skills scored highly, with majority of participants expecting to resuscitate newborn infants in their future career (95%) and eager for structured training (98%) within their existing resident curriculum. Within the last academic year, 65% had attended at least 1 term infant delivery, whereas only 15% participated in resuscitation of a preterm infant. Residents reported lowest confidence with neonatal intubation (65%) and emergent umbilical venous catheter insertion (70%), and greatest confidence in their ability to provide adequate chest compressions (90%). There was minimal improvement in post test scores comparing the knowledge in control and intervention groups (48% ± 4.3 vs. 50% ± 3.7, p=0.36).

Conclusions EM residents desire structured training in neonatal resuscitation. They report discomfort in leading a resuscitation but moderate confidence with skills required to resuscitate a newborn; however, when tested on content they scored poorly. Two high fidelity simulation training sessions 6 month apart may not be sufficient to improve EM residents' knowledge. A structured simulation curriculum specifically geared towards EM residents to learn NRP skills needs to be implemented.

Adolescent medicine and behavior development I

Concurrent session

10:10 AM

Friday, January 29, 2021

64 MATERNAL MENTAL HEALTH AND POSTPARTUM DEPRESSION IN THE COVID-19 PANDEMIC

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10.1136/jim-2021-WRMC.64

Purpose of Study Previous studies examining the impact of natural disasters noted that in the setting of consistent rates of major depressive disorder, postpartum depression (PPD)

increased in vulnerable postnatal subgroups. COVID-19 may affect maternal health in similar ways. Given the significant impact of PPD on both mother and child, this study aimed to characterize the effect of COVID-19 on the incidence of PPD and identify subgroups at elevated risk for PPD.

Methods Used This retrospective chart review of maternal-newborn dyads, born at ≥ 37 weeks' gestation, admitted to the Mother Baby Unit, was conducted at a quaternary academic medical center over two time periods: pre-COVID-19 (Jan 1 – Jun 1, 2019) and during COVID-19 (Jan 1 – Jun 1, 2020). PPD was defined as an Edinburgh Postnatal Depression Scale score of ≥ 10 at any postnatal appointment. History of and/or current mental health diagnoses [major depressive disorder (MDD), generalized anxiety disorder (GAD)] were recorded. Data were analyzed using chi-square and t-tests.

Summary of Results The study included 1073 dyads (567 in the 2019 epoch, 506 in the 2020 epoch). The cohorts had similar clinical and sociodemographic characteristics. Rates of PPD between the cohorts were similar (18.5% to 18.2%, $p=0.95$). In subgroup analyses, PPD rates were similar amongst primiparous births (18.7% to 21.9%, $p=0.44$) and publicly-insured mothers (26.7% to 25.7%, $p=0.94$). The 2020 cohort exhibited higher incidence of current mental health diagnoses: MDD (10.1% to 14.2%, $p<0.05$) and GAD (10.6% to 18.6%, $p<0.01$). However, incidence of PPD among women with current mental health diagnoses decreased from 47.1% in 2019 to 30.4% in 2020 ($p=0.02$).

Conclusions Few prior studies have investigated the effect of the COVID-19 pandemic on PPD. Notably, a stable PPD rate despite an increase in current mental health diagnoses, highlights the complexity of the biopsychosocial milieu contributing to PPD. Decreased PPD in women with mental health diagnoses may reflect improved treatment success in those with current diagnoses or decreased identification from limited screening or healthcare access. Further study of psychiatric care access and treatment is an important next step in understanding the relationship between mental health diagnoses and PPD during the COVID-19 pandemic.

65

PARENTAL INVOLVEMENT IN CHILDREN'S EATING BEHAVIORS FOR HEALTHY BMI

D Jhang*, BM Rodriguez, R Guest, M Baum. *Loma Linda University School of Medicine, Loma Linda, CA*

10.1136/jim-2021-WRMC.65

Purpose of Study The estimated childhood obesity rate in the U.S. is one in three and predicted to increase. Obesity's negative impacts on health have been consistently demonstrated. Parents are significant influences for their children in the development of healthy eating behaviors by modeling eating behavior and providing food. This study aims to determine if a significant relationship exists between healthy BMI (<85%ile) and unhealthy BMI (>85%ile) children regarding two aspects: involvement of parents in their children's eating behaviors and the children's own eating behaviors.

Methods Used Children aged 9–15 yrs, were referred from a local FQHC by pediatric and family medicine clinics to a 1-week healthy interventional day camp in Loma Linda, CA,

called Operation Fit. Kids learned healthy eating behaviors and participated in various physical activities. Kids were of either healthy (5th-85th percentile) or unhealthy BMI (>85th percentile) and completed pre-camp surveys regarding eating behaviors and parental involvement. Data from 2011–2019 was analyzed.

Summary of Results A chi-square statistical test and odds ratio showed that parents of healthy BMI children were more likely to discuss food choices [X^2 (1, N = 803) = 13.07, $p = 0.0003$; OR = 1.83]; healthy BMI kids were less likely to think about making healthier food choices [X^2 (1, N = 800) = 5.05, $p = 0.025$; OR = 0.49]; healthy BMI kids were slightly more likely to eat less than 3 times per day [X^2 (1, N = 798) = 6.91, $p = 0.0086$; OR = 1.07].

Conclusions Parental involvement in discussing food choices with kids most significantly correlated with healthy BMI. Healthy BMI kids were less likely to think about making healthier food choices, which might correlate with already formed healthy eating behavior. The least significant difference was seen with the number of times a child ate per day. The quality of the food may most likely matter more than the quantity consumed.

66

BEHAVIOR CHANGE IN YOUTH BASED ON TYPE OF FAMILIAL LOSS

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10.1136/jim-2021-WRMC.66

Purpose of Study Grief following the death of a loved one creates emotional trauma on family members, especially the youth. The purpose of this study is to examine the differences in behavior depending on if the familial loss was a sibling or another family member.

Methods Used Children and youth that experienced death of a family member were invited to attend Camp Good Grief (CGG), while children that experienced a violent death of a family member were invited to attend Special Victims Camp (SVP). These camps focused on helping the campers manage their grief. Parents of the children filled out questionnaires documenting behavioral, emotional, relationship, etc. responses regarding their child prior to the death, pre-camp, and post-camp. Problematic behavior traits were split into 15 categories with rankings within those categories of 1–6, with 1 meaning the behavior never happened and 6 meaning the behavior always happened. A rating of 1–3 was indicative of the child not displaying the behavior, while a rating of 4–6 indicated the behavior. The number of behaviors each child displayed was tallied.

Summary of Results The results of the survey showed that there was statistically significant difference between the behavior change of CGG campers based on whether the death was that of a sibling or another family member ($p<.00001$), indicating children experiencing the death of a sibling are at 50% lower odds for behavior change than children experiencing the death of another family member. However, no statistical significance was shown between SVP camper behaviors based on sibling or other familial loss ($p=.45491$). There was also no statistically significant difference between the behavior changes exhibited by SVP campers and CGG campers ($p=.849701$).

Conclusions It appears that there is a correlation between increased behavior change in children that experience the death of a non-sibling family member. This outcome is reasonable due to the influential effects of older relatives as role models for young people. Further exploration is needed to determine the true directionality of behavior change whether that means acting out more or withdrawing.

67 WHAT ARE PARENTS READING ABOUT THE SUNSCREEN CONTROVERSY?

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10.1136/jim-2021-WRMC.67

Purpose of Study Despite the benefits of sunscreen use, downside risks include vitamin D deficiency, oxybenzone-related hormone disruption, nanoparticle skin penetration, and harm to coral reefs. Benefits of sunscreen are likely greater in children, but the long-term risk of prolonged chemical exposure harm starting in childhood is difficult to confirm to be benign. With this confusing backdrop of sunscreen debates, parents may be looking to the internet as their source of sun safety information. The purpose of this study is to survey and summarize the sunscreen recommendations presented to parents on the internet to provide healthcare professionals with a general awareness of this.

Methods Used We read and evaluated the first 50 websites after searching 'sunscreen safety in children' on Google. To standardize our evaluation of the websites, we created criteria to apply to each website based on nationally recognized main points on sunscreen benefits, previously debated issues surrounding sunscreen use, the stance of the website's recommendation of sunscreen, and the intention of the website to inform the reader or sell a product.

Summary of Results A summary of our results is detailed in table 1.

Conclusions Most of the websites aimed to inform parents (rather than sell a product) and recommended the use of sunscreen. However, many of these websites were blogs or personal opinion pieces; these websites incompletely detailed the benefits of sunscreen use and overlooked the anti-sunscreen debates parents may have previously been aware of. This variability of the online information lacks clarity to determine the overall benefit of sunscreen in reducing their child's skin cancer risk, and may be useful for physicians to be aware of when counseling parents.

68 OUTCOMES OF INITIAL CONSERVATIVE TREATMENT IN ADOLESCENT PATIENTS WITH STABLE OSTEOCHONDRITIS DISSECANS OF THE ELBOW

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10.1136/jim-2021-WRMC.68

Purpose of Study Osteochondritis dissecans (OCD) is a disorder characterized by separation of subchondral bone and articular cartilage from underlying bone due to lack of blood supply. Effective treatment of elbow OCD is still debated. The purpose of this study is to compare the characteristics and clinical outcomes of adolescent patients diagnosed with stable OCD of the elbow who either progressed to surgery or did not after initial conservative treatment.

Methods Used We performed a retrospective chart review of patients 5–18 years of age who were diagnosed with stable OCD of the elbow and initially underwent conservative treatment at Children's Hospital Colorado. Demographic and radiographic variables such as age, sex, skeletal maturity, and lesion size were collected. Clinical outcomes collected included time to return to sport and need for second surgery. Statistical analysis was performed using T-tests, Mann Whitney U tests, and Fisher's exact tests with Stata version 15.

Summary of Results We identified 18 patients to meet inclusion criteria; 11 progressed to surgery and 7 did not. There were no significant differences between groups regarding sex, age, skeletal maturity or insurance type. Loss of range of motion in the elbow was seen in 64% of patients who progressed to surgery and in 29% of those who did not ($p = 0.34$). While there were no significant differences in radiographic measurements between groups, those who progressed to surgery had greater average lesion sizes than those who did not ($p=0.22$). We did not observe any significant differences in time from diagnosis to return to sport.

Conclusions Overall, there were no significant differences between patients who progressed to surgery versus those who did not regarding patient characteristics or clinical outcomes. However, it may be clinically useful to consider loss of range of motion and size of lesion when treating these patients. The high percentage of patients progressing to surgery emphasizes that stable OCD lesions in the elbow behave differently than those in the knee, where the rate of progression to surgery can be as low as 15%. Factors associated with healing of stable OCD lesions and the benefits of conservative treatment should be further investigated.

Abstract 67 Table 1 Summary of website results

| Main Points (Y/N) | Y |
|---|--------------|
| Informs about benefits of sunscreen | 44% |
| - Reduce skin cancer | 40% |
| - Prevent sunburn | 28% |
| - Decrease skin aging | |
| Issues Identified (Y/N) | Y |
| Informs about sunscreen products entering bloodstream at higher than recommended amounts by FDA | 20% |
| - Identifies questionable ingredients that enter the bloodstream recognized by the FDA | 12% |
| - Informs about ingredients generally recognized as safe: zinc oxide and titanium dioxide | 24% |
| Informs about increased DEET absorption with combined insect repellent-sunscreen use | 8% |
| Cautions on sunscreen use below six months of age | 56% |
| Addresses vitamin D deficiency with sunscreen use | 4% |
| Identifies concern for sunscreen particle inhalation with spray | 22% |
| Informs about potential hormone disruption in chemical sunscreens | 22% |
| Website Stance | |
| Stance on sunscreen use: | 50%; 46%; 4% |
| - Strongly recommends, neutral (informs only), recommends against | Inform: 74%; |
| Purpose: inform reader or sell product | Sell: 26% |

FDA = Food and Drug Administration; DEET = N,N-Diethyl-meta-toluamide

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DISRUPTIVE BEHAVIORS AMONG CHILDREN AND TEENS WHO EXPERIENCED EITHER A TRAUMATIC/UNEXPECTED OR NATURAL LOSS

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10.1136/jim-2021-WRMC.69

Purpose of Study Understanding the grief process in children and the effects of experiencing a death/loss is critical for caregivers to provide appropriate support. Losing a loved one can impact several aspects of a child's life, such as functioning at home, school, peer relationships, spiritual beliefs, and concept of self. Moreover, the grief process and its manifestations can differ depending on whether or not the loss was traumatic/unexpected. This study aims to determine if disruptive behaviors are more likely to be reported at a higher frequency among children who experience traumatic/unexpected losses.

Methods Used Children/teens 10–16 years old who have lost a sibling or parent attended a 3-day grief therapy camp in Loma Linda, CA called Camp Good Grief. It provided a safe space to share thoughts and feelings with others who have experienced a loss in order to understand and normalize the grief process. Parents filled out pre-camp surveys categorized as either traumatic/unexpected loss (SVP group) or natural loss (CGG group). 194 CCG and 110 SVP surveys were analyzed for questions regarding disruptive behaviors, reported as low or high frequency. Behaviors included temper tantrums, lies, manipulates situations, steals, something terrible, discipline problem home, discipline problem school, fighting, and family problems.

Summary of Results A chi-square statistical test showed a statistically significant difference between the two groups for only one behavior – discipline problem school; $X^2(1, N = 294) = 5.68, p = 0.017$. Parents of children who experienced a traumatic/unexpected loss were 91% more likely to report temper tantrums as a high frequency behavior at a 95% confidence interval (OR = 1.91).

Conclusions Parents of children, part of the SVP group were more likely to report ‘discipline problem school’ as a high frequency behavior. This behavior was the only one to primarily occur outside of the home environment. Due to the traumatic nature of the loss, SVP kids may be more likely to exhibit behavioral issues outside of the home. The significance may also be explained by the fact that parents were unable to directly observe the behavior and not available to respond. At school, no adults may be available to spend quality time with the child about the behavior.

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TEAM NEMO CONSULT SERVICE: EXTENDING THE IMPLEMENTATION OF EARLY DIAGNOSIS AND INTERVENTION FOR CEREBRAL PALSY PRIOR TO DISCHARGE FROM THE NICU

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10.1136/jim-2021-WRMC.70

Purpose of Study Early diagnosis of cerebral palsy (CP) is the key to early intervention. The HRIF clinics at UCLA implemented guidelines for early diagnosis and early intervention for CP and decreased the average age of CP to under 12 months. Team NEMO (Neurodevelopment and Early Movements Observation) consult service was formed to sustain

gains made during the first year of implementation and extend screening to the NICU.

Methods Used

Setting:

UCLA NICU and HRIF clinic

Patients and methods:

Our process included 4 stages:

1. Exploration – SIPOC analysis, SWOT analysis, IRB approval
2. Installation – process flow design, pre and post surveys to assess effectiveness of consult, preparation of materials
3. Initial implementation – data collection, refining process flow design, weekly team meetings, monthly site calls
4. Full implementation – monitoring fidelity, sustaining gains

GMA of all babies in the NICU were assessed. Those who met criteria for HRIF and those with Cramped Synchronized (CS) GMA were identified for a NEMO in-patient consult. Families received counseling about the GMA and about follow up at the HRIF clinic. At the 3–4 mo HRIF visit, parents completed a survey. This data was compared to parents who were surveyed prior to implementation of the NEMO consult.

Summary of Results To date, 27 Team NEMO in-patient consults have been completed. Of these, 6 had CS GMA and 2 had absent fidgety movements at 3 months corrected age. Parent knowledge about the HRIF clinic increased in multiple categories (purpose of HRIF appointment increased from 78% to 100%, need for neurodevelopmental follow up increased from 46% to 92%, appointment duration increased from 41% to 73%). 92% families reported being aware of the GMA post-NEMO consult. During year 2, there were 6 new diagnosis of CP with the average age being 10.7 months.

Conclusions Team NEMO consult service improved parent knowledge about HRIF and GMA and helped maintain successful implementation of evidence-based guidelines. Future directions include expanding the program to include other sites, improve the quality of our existing process flow and to provide support for families that receive a diagnosis of cerebral palsy.

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ADDRESSING THE LONELINESS EPIDEMIC: THE IMPACT OF LEARNING COMMUNITIES ON MEDICAL STUDENTS' SENSE OF CONNECTION AND BELONGING

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10.1136/jim-2021-WRMC.71

Purpose of Study In an increasingly digital age, social isolation underlies many mental and physical health concerns. Medical students are especially at risk, given the stressful workload and high performance demands. However, emerging medical education research highlights the potential of learning communities (LCs) to ‘positively influence the overall learning environment’ (Smith et al., 2016), so we seek to discover if LC group sizes make a difference in students’ connection and belonging with their class.

Methods Used A LC consists of a group of students assigned to a physician faculty mentor throughout medical school. Two cohorts of first year students, Class of 2022 (C2022) & Class of 2023 (C2023), were compared. C2022 LCs consisted of 12–15 students per group, while C2023 LCs had 8–10 students per group. Both cohorts met with their LC about 20 times in the year for curriculum and mentorship. Students were asked to assess statements on Likert scales as part of

their end-of-year surveys about their perceptions of the impact of LCs, such as sense of belonging within LCs, mentor's role and students' abilities to foster connection, and students' sense of appreciation for their class contributions.

Summary of Results C2022 had 161 responses, while C2023 had 137 responses. C2023 scored significantly higher ($p < 0.001$) when assessing the statements '[learning] communities contributed to connections I made' and 'facilitator fosters connection in the group'. Regarding students' sense of belonging in the class, C2023 demonstrated narrower yet more positive response distributions, but evidence is inconclusive ($p = 0.116$). Regarding student appreciation for their class contributions, C2023 had a more positive and homogeneous distribution than C2022, but with marginally inconclusive evidence ($p = 0.051$).

Conclusions Compared to C2022, C2023 reported more positive perceptions about LCs. This may be due to the decrease in student-mentor ratio, thus allowing for more interpersonal interactions. C2022 was also the first class to implement LCs, demonstrating how new programs can take time to become integrated. These results shed light on optimal LC sizes and are promising for future research regarding their value to medical students.

Immunology and rheumatology

Concurrent session

10:10 AM

Friday, January 29, 2021

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CLINICAL CHARACTERISTICS OF LATE-ONSET SPONDYLOARTHRITIDES

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10.1136/jim-2021-WRMC.72

Purpose of Study Spondyloarthritis are a group of inflammatory rheumatic diseases with a global prevalence of 1%. Late onset spondyloarthritis (SpA) is considered rare but cases are expected to increase as the U.S. life expectancy increases. Early and late-onset SpA are considered pathologically similar, but several small observational studies suggest that they present with different clinical characteristics. Further, few research studies have quantified the effectiveness of tumor necrosis factor inhibitor (TNFi) therapy in late-onset SpA. This study examined the clinical differences and reasons for TNFi discontinuation in early-onset and late-onset spondyloarthritis in the U.S. Veteran Affairs health care system.

Methods Used US veterans enrolled in the Program to Understand the Longterm Outcomes in Spondyloarthritis (PULSAR) from 2007 – 2019 who were diagnosed with ankylosing spondylitis, psoriatic arthritis, reactive arthritis, undifferentiated spondyloarthritis, and IBD-associated arthritis were included in the study. Late-onset SpA was defined as symptom onset beginning after age 50.

Summary of Results 115 individuals with late-onset SpA treated by 136 TNFi courses were compared to 424 individuals with early-onset SpA treated by 498 TNFi courses. The mean age

of enrollment was 65.73 for the late-onset group, compared with 51.86 for the early-onset group. Significantly more patients with early-onset SpA were human-leukocyte antigen (HLA) B27 positive ($P < 0.01$). For both late-onset and early-onset SpA patients, the most common reason for TNFi discontinuation was secondary failure (42% early-onset, 36% late-onset), defined as loss of efficacy after >6 months of treatment, followed by adverse events (23% early-onset, 27% late-onset).

Conclusions This study suggests that late-onset SpA patients have a lower frequency of HLA B27 and the reasons for TNFi discontinuation are similar for early-onset and late-onset SpA. In contrast to the approach of prior studies, use of the data of symptom onset, rather than the date of diagnosis, likely resulted in a more accurate classification of cases in the study. Further studies should evaluate clinical outcomes in older onset spondyloarthritis patients to better quantify the effectiveness of treatments for this population.

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NOVEL CORONA VIRUS PANDEMIC- 2019 AND PATIENT EXPERIENCE COMPARING TELEMEDICINE WITH CONVENTIONAL CLINIC VISIT IN PATIENTS WITH JUVENILE IDIOPTHIC ARTHRITIS AND CHILDHOOD SYSTEMIC LUPUS ERYTHEMATOSUS

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10.1136/jim-2021-WRMC.73

Purpose of Study The COVID-19 pandemic changed the physician-patient interaction. Telemedicine has emerged as the universal method of communication with patients. We compared conventional clinic visit (CCV) with telemedicine (TM) in clinic administered through video conferencing. Physician patient communication is key in determining treatment outcome and patient satisfaction in complex auto immune disease process including Systemic Lupus Erythematosus (cSLE) and Juvenile Idiopathic Arthritis (JIA).

Methods Used We performed a quality improvement project using a telephone questionnaire survey in rheumatology clinic at Valley Children's Healthcare. We surveyed 25 patients total. The respondents in the survey experienced both CCV before and during pandemic and TM during pandemic.

Summary of Results Among the 25 patients surveyed 15 had JIA and 10 had cSLE. Among JIA patients 95% felt doctor was paying attention, able to make shared decision regarding the medications and treatment options. All the JIA and cSLE patients in the group felt that doctor listened and asked appropriate questions. Patients in both groups felt they were able to discuss all their problems and had a strong positive impact on the quality of care during the TM visit as compared with CCV. In cSLE group 70% felt shared decision making and ability to discuss their medical problem via TM was not as good as CCV.

Conclusions This survey divulged patient perspective regarding clinic visit during pandemic. Telemedicine is preferred by 95% and 75% of the respondents over the conventional clinic visit during the pandemic among JIA and CSLE groups. The main concerns were breakdown of the physician-patient relationship and issues regarding the technologies with connectivity along with organizational challenges. Patients in both groups strongly

agreed that TM met the need for their care compared to conventional clinic visit. Patients in the JIA group were satisfied with TM visit in handling complex medical problems and shared decision making. Patients in cSLE group preferred CCV especially in addressing complex medical issues and shared decision making.

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PATIENT EXPERIENCE WITH TELEHEALTH IN A PEDIATRIC RHEUMATOLOGY CLINIC DURING THE NOVEL CORONAVIRUS PANDEMIC 2019

Y Moufarrej*, D Singh, R Patel, S Sukumaran. *Valley Children's Hospital, Madera, CA*

10.1136/jim-2021-WRMC.74

Purpose of Study Physician interactions with their patients have changed drastically during the COVID-19 pandemic. However, physician-patient communication remains key in determining treatment outcomes in complex autoimmune disease processes. Telehealth has emerged as one of the major methods of communication during this time. Appropriate communication with patients and caregivers is critical in not only patient satisfaction but also adherence with the treatment plan.

Methods Used We performed a quality improvement project using a telephone questionnaire to survey patients seen via telehealth by the rheumatology clinic at Valley Children's Healthcare. The survey was performed 3–6 weeks after the telehealth visit.

Summary of Results We surveyed 53 patients, of which 93% had previous experience with telehealth. Of the total respondents, 98% found telehealth convenient; 90.5% preferred telehealth due to not having to take time off from work, 95% as they did not have to travel to the appointment, and 93% due to fear of the pandemic. Among the participants, 95.5% felt the doctor was listening and asking appropriate questions, 95% stated that the doctor explained the medications and workup appropriately, and 98% felt that the doctor answered all of their questions. Conversely, 2% of participants felt that the doctor was in a hurry, and 7.54% felt that the physical exam performed over telehealth was inadequate for their condition.

Conclusions Our study demonstrates that telehealth is not only acceptable but also beneficial overall for rheumatology patients, particularly due to expediency. Respondents agreed that telehealth met the needs for their care. Technology, difficulties with connectivity, and the ability to perform a physical exam, however, remain limiting factors in telehealth that must be addressed. Despite this, participants had a positive outlook as to the use of telehealth in rheumatology and believed it posed no burden on the patient-physician relationship and instead felt heard and cared for by their physician. In the future, it has the ability to improve access to care and facilitate timely diagnosis as well as appropriate intervention.

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AN INTERESTING CASE OF STATIN INDUCED AUTOIMMUNE MYOPATHY

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10.1136/jim-2021-WRMC.75

Case Report Statins are one of the most widely prescribed drugs in the world. One of the common side effects of statin

use is myopathy. We report a rare case of statin induced autoimmune myopathy, which is a rare variant of statin-induced myopathy. A 56-year-old female with a history of hypertension, hyperlipidemia, cerebral aneurysm status post clipping, and seizure disorder presented with progressive muscle weakness. Her initial laboratory results demonstrated elevated liver function tests and an elevated creatine phosphokinase (CPK) of 17144 IU/L. Patient's atorvastatin was discontinued and she was placed on high rate intravenous fluids, but despite this, her CPK remained elevated. Patient underwent further blood testing for specific autoimmune etiologies. As there was high concern for autoimmune myositis, she was started on high dose steroids. Anti-HMG CoA reductase antibody returned strongly positive. While the patient was on steroids, her muscle weakness, CPK level, and liver functions gradually improved. She was discharged on oral steroids. She also had imaging and lumbar puncture to rule out other causes of her motor weakness on initial presentation. Statin induced autoimmune myopathy should be considered with high suspicion when there is significant elevated CK level and discontinuation of statin therapy does not lead to muscle recovery or improvement in the CPK level. Diagnosis is confirmed by positive anti-HMG-CoA reductase autoantibody and biopsy.

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PLATELET/LYMPHOCYTE RATIO AS A POTENTIAL BIOMARKER FOR DISEASE ACTIVITY IN ANKYLOSING SPONDYLITIS

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Purpose of Study Ankylosing spondylitis (AS) is a chronic inflammatory disease involving the sacroiliac joint (SIJ) and the spine. These joints can be involved with erosions or fusion, which can be debilitating and affect quality of life. Though several medications are available for use in AS, clinicians face challenges in classifying patient's disease activity. The most commonly used biomarker of disease activity—the c-Reactive Protein (CRP)—has been shown to have low specificity and sensitivity. Prior studies have shown that the neutrophil/lymphocyte ratio (NLR) and platelet/lymphocyte ratio (PLR) are associated with disease activity and severity for inflammatory diseases such as malignancies and ulcerative colitis. This study evaluates the utility of the NLR/PLR as biomarkers for AS disease activity and severity by examining their association with CRP and SIJ damage scores.

Methods Used Data were drawn from the Program to Understand Long-Term Outcomes of Spondyloarthritis registry; only patients treated at the Rocky Mountain Regional VA Hospital were included. SIJ radiographs were scored for sacroiliitis based on the modified New York (mNY) radiographic criteria. Patients not meeting criteria were excluded. Absolute neutrophil count, lymphocyte count, platelet count, and CRP were collected within 6 months of the radiograph. Demographic data including HLAB27 status were collected. The relationship between NLR, PLR, CRP and mNY scores was determined using regression techniques in the STATA (v13) statistical package.

Summary of Results 42 patients met radiologic mNY radiologic criteria for sacroiliitis. No statistically significant correlation was found between mNY radiograph scores and the NLR nor the PLR. However, CRP concentration was associated with the PLR ($R^2 = 0.3205$, $p < 0.001$).

Conclusions A more accurate biomarker for AS disease activity would be very helpful. Though our study did not show a correlation between NLR and PLR, we did identify a relationship of PLR and CRP. Further studies are needed to validate these results in other populations, explore the relationship of PLR with patient reported outcomes, and determine if PLR is associated with findings from other imaging modalities.

77 USE OF ANAKINRA FOR CORONAVIRUS DISEASE 2019 ASSOCIATED MULTISYSTEM INFLAMMATORY SYNDROME IN CHILDREN

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10.1136/jim-2021-WRMC.77

Purpose of Study To discuss the diagnosis and management of a child treated with Anakinra for the COVID-19 associated pediatric disorder, Multisystem Inflammatory Syndrome in Children (MIS-C).

Methods Used Retrospective Chart Review

Summary of Results A 7-year-old male presented to our institution with 5 days of fever, sore throat, vomiting, diarrhea and abdominal pain. Physical examination was remarkable for a febrile, ill-appearing child with tachycardia and respiratory distress. He was hypoxicemic to 89%. He had with oral ulcers, hepatomegaly and poor perfusion. He was started on oxygen and inotropic agents and admitted to the PICU.

Laboratory evaluation revealed a positive SARS-CoV-2 PCR and SARS-CoV-2 IgG. Additional pertinent labs included leukopenia, lymphopenia, thrombocytopenia, hyperferritinemia, and elevated CRP. ECHO showed depressed left ventricular systolic function with ejection fraction of 43%. Child's troponin was 2.7 ng/ml and BNP 2439 ng/L.

He was started on remdesivir but continued to clinically deteriorate with persistent fever and increase in ferritin. His soluble IL-2 receptor and IL-6 level were highly elevated. Repeat ECHO demonstrated dilatation of the coronary arteries.

Based on clinical and laboratory evaluation, child met the American College of Rheumatology criteria for MIS-C. He received IVIG and steroids, without improvement in fever or markers of inflammation and therefore was started on anakinra for 5 days. Within 24 hours of initiation of anakinra, child demonstrated clinical and laboratory improvement and was discharged home on low dose aspirin on hospital day 12.

Conclusions Anakinra is among several biologic drugs that inhibit specific inflammatory cytokines which have an essential role in the cytokine storm that occurs in children with MIS-C. Anakinra targets and inhibits the IL-1 β receptor protein which prevents activation of the cytokine storm and subsequent organ dysfunction.

Our patient was refractory to conventional treatment with IVIG and steroids but responded well to anakinra and completely recovered. As the cases of COVID-19 in children continue to rise, clinicians should be aware of the clinical presentation of MIS-C and its treatment to prevent adverse outcomes.

78 PROLIFERATION AND DIFFERENTIATION POTENTIALS OF CLONAL HUMAN ARTICULAR CARTILAGE PROGENITOR CELLS

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10.1136/jim-2021-WRMC.78

Purpose of Study The aim of this study was to compare human articular cartilage progenitor clones from different zones in terms of their expansion and differentiation.

Methods Used Cells were isolated from superficial and deep zones of normal human articular cartilage. Clones were stimulated to undergo chondrogenesis *in vitro* in 3D pellet culture for 14 days at 20, 40, and 60 population doublings.

Summary of Results Superficial clones have a significantly higher percentage survival at 20, 40, and 60 population doublings compared with deep clones. Superficial clone-derived pellets had significantly increased ($p < 0.05$) total glycosaminoglycan (GAG, a measure of proteoglycan production) and hydroxyproline content compared with their deep zone counterparts at 20 population doublings. Collagen X production was significantly increased ($p < 0.05$) in deep compared with superficial ACP clones. All zonal differences were no longer evident once cells had undergone 40 or greater population doublings. No differences in the level of gene expression ($p > 0.05$) were detected for COL1A1, COL2A1, SOX9, or PRG4 either prior to chondrogenesis (day 0) or 14 days after induction for clones at 20, 40 or 60 population doublings. A significant increase in COLXA1 gene expression ($p < 0.05$) in deep clones was observed at 40 population doublings after chondrogenic induction for 14 days but not prior to induction (day 0) or at either day for clones of 20 or 60 population doublings. ACAN gene expression was also significantly increased ($p < 0.05$) in day 14 deep zone pellets at 40 population doublings compared with superficial zone pellets.

Conclusions These data reveal the differences between populations of chondrogenic progenitors residing in different zones of human articular cartilage. Superficial zone clones have increased survival and propensity to form stable articular cartilage *in vitro* compared to deep zones clones. Differences seen in the matrix production at 20 population doublings are lost at 40 doublings and higher; this may be due to the survival of only higher matrix-producing clones from the deep zone with increased doublings.

79 VALIDATING A SCORING SYSTEM FOR IMMUNOGLOBULIN UNRESPONSIVENESS IN HIGH RISK KAWASAKI DISEASE

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10.1136/jim-2021-WRMC.79

Purpose of Study The purpose of this study is to report outcomes of children with high-risk Kawasaki disease (KD). We aim to validate the prediction model for unresponsiveness to intravenous immunoglobulin (IVIG), and to determine if there is a change in responsiveness to IVIG if steroids are given additionally in high-risk KD patients.

Methods Used This is a single center retrospective study examining outcomes in children from 0 and 18 years old with KD

before and after the introduction of a protocol for the treatment for high-risk KD. Criteria to qualify for the high risk protocol included: age ≤ 12 months or ≥ 8 years, Z score of LAD or RCA ≥ 3.5 , or CRP ≥ 15 mg/dL with one additional finding of the following WBC $\geq 20,000$, Platelet count $\leq 150,000$, Sodium ≤ 133 , Albumin ≤ 2.8 , Hemoglobin ≤ 8 , and/or ALT ≥ 100 . We compared the rate of unresponsiveness to IVIG among the children who would have met these criteria before the protocol was implemented and after. A patient will be considered unresponsive to IVIG therapy if they received additional therapy (IVIG, steroids, infliximab or another biologic) or the Z-score for the RCA ≥ 3.5 or LAD ≥ 3.5 .

Summary of Results There was a total of 129 patients and 74 were female (57%). The number of patients who met high risk KD criteria was 49, 25 were female (51%), and 31 (63%) met criteria by age alone. Prior to the implementation of the protocol 42 (37%) patients met criteria and 7 (50%) after. There were 39 patients (30%) who failed to respond to IVIG during the entire time, 36 (31%) prior and 3 (21%) post implementation.

Conclusions After the implementation of the high-risk KD protocol, there was a significant improvement in the responsiveness to IVIG. We believe that early steroid administration in these high-risk patients can prevent the need for additional therapy.

Infectious diseases I

Concurrent session

10:10 AM

Friday, January 29, 2021

80 INCREASED SUSCEPTIBILITY TO INFECTIOUS DISEASES DUE TO MEASLES-INDUCED IMMUNOSUPPRESSION: A SYSTEMATIC REVIEW

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10.1136/jim-2021-WRMC.80

Purpose of Study Measles continues to be one of the leading causes of vaccine-preventable illness and death worldwide. Current studies have suggested that measles can induce immunosuppression for approximately 2–3 years following a primary measles infection, increasing a host's susceptibility to infectious diseases. In low- and middle-income countries (LMICs) with lower rates of measles vaccine coverage and higher rates of infectious diseases, post-measles immunosuppression (PMI) may contribute to disparities in health outcomes. This systematic review aims to investigate the degree of increased susceptibility of a host to infectious diseases due to measles-induced immunosuppression.

Methods Used We searched PubMed, Embase, Cochrane, and Web of Science for articles on PMI published between January 1, 2000 to July 8, 2020. We included observational studies, modeling studies, review articles, and RCTs involving populations of any age in any geographic location with quantitative estimates of the change (or lack thereof) in the risk of

infection or mortality from non-measles infectious diseases following measles infection. We excluded studies with no relevant data, that used non-human models, and that were written in languages other than English.

Summary of Results Of 1,048 articles screened, 6 studies met inclusion criteria for this review. In children with previous measles infection, two studies found a 3 fold increased risk of infection-related rehospitalizations between 1 month and 1 year following measles, two studies found a 2–3 fold increased risk for infectious disease symptoms for 2 to 3 years following measles, and two studies found a 1.5 fold and 10–85 fold increased susceptibility to VZV and whooping cough, respectively, following measles.

Conclusions Current studies that do not account for PMI likely underestimate the global burden of measles. More studies are needed to better characterize PMI, particularly in LMICs. These results will help policy-makers better understand the true global health burden of measles and accurately assess the full benefits of the measles vaccine.

81 ASSESSING ONLINE CONTENT ON TDAP VACCINATION IN PREGNANCY USING INSTAGRAM & FACEBOOK

S Feng*, T Le, K Lee, J Maticotta, AL Nelson. Western University of Health Sciences College of Osteopathic Medicine of the Pacific, Pomona, CA

10.1136/jim-2021-WRMC.81

Purpose of Study Tdap vaccine is recommended for pregnant women and newborn contacts are to be up-to-date to provide infant protection from pertussis (cocooning). Many women turn to social media platforms. We surveyed two social media platforms to assess the questions women asked about the Tdap vaccination and the quality of responses received.

Methods Used *Instagram* and *Facebook* were chosen for this project because users can write posts without any word limits. Keywords related to Tdap vaccination during pregnancy were used to search related posts from 2012 to Feb. 2020. For Facebook, only Tdap-related posts with either more than 10 comments or 10 shares were included. Instagram posts needed to have either more than 10 comments or 10 likes. CDC guidelines were used to judge the accuracy of the posts.

Summary of Results We performed a detailed scoping of 100 *Facebook* posts, 95 *Instagram* posts and comments related to Tdap during pregnancy. Inaccuracies were found in 79% of advising posts from *Facebook* nonprofessional users and 32% of such advising posts on *Instagram*. Common themes found within *Facebook* advising posts were questions about Tdap side effects, Tdap safety, and issues related to cocooning. Disturbingly, the most popular subtheme was that Tdap vaccination leads to spontaneous abortion. Common themes found within *Instagram* posts were advice to take Tdap, and cocooning support, but also reasons for not getting Tdap. The most popular subtheme was advice for Tdap during the 3rd trimester.

Looking at the comments, the top three themes from 537 *Instagram* comments were side effects of Tdap vaccination (32%), safety of Tdap vaccine (26%) and cocooning (17%). On the other hand, the top three themes from the 2877 *Facebook* comments related to those posting were concerns that the FDA labeling said Tdap had not been tested in pregnancy (39.8%), Tdap safety (35.2%), and Tdap ingredients (10.6%). Lastly, professional postings were analyzed separately; 23% of

Facebook posts and 25% of Instagram posts from health care professionals and organizations contained inaccuracies.

Conclusions Women have residual questions about the safety and need for Tdap vaccines for themselves and those who will be around the newborn. Clinicians should clear up this misinformation when offering the vaccine.

82 EPIDEMIOLOGY OF PEDIATRIC OSTEOARTICULAR INFECTIONS IN THE UNITED STATES

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10.1136/jim-2021-WRMC.82

Purpose of Study Osteoarticular infections in pediatric patients are a cause of significant morbidity. Previous studies have estimated that long-term complications arise in up to one-third of children recovering from acute osteomyelitis or septic arthritis, with limb length discrepancies occurring in about 10% of children recovering from chronic osteomyelitis. Information on the epidemiology and clinical outcomes of osteoarticular infections in children is scarce, however. Using data from the national HealthFacts database, we herein report what to our knowledge is one of the largest descriptions of pediatric osteoarticular infections.

Methods Used Children ≤ 18 years of age at the time of diagnosis were included. Osteoarticular infections were classified using 360 different International Classification of Diseases (ICD) version 10 diagnosis codes for acute osteomyelitis (AOM), chronic osteomyelitis (COM) or acute septic arthritis (ASA). The diagnosis codes were then entered into the HealthFacts national medical database. Utilizing this database, we analyzed cases of pediatric osteoarticular infections over a 3 year period (2015–2017) and assessed long-term outcomes (up to 2 years) following discharge. P-values were assessed with a Welch's t-test.

Summary of Results Overall, 1,908 subjects were identified. ASA was the most common presentation (54.5%), with COM

the least common (18.0%). In all three conditions, boys were more commonly affected (58.0% overall). Children with COM were slightly older on average than those with AOM or ASA (10.6 years vs 8.8 years and 8.1 years, respectively). The most common season for diagnosis was winter for all conditions (33.0% of all cases). A pathogen was isolated only 40.0% of the time, with *S. aureus* the most common. In COM, 34.1% of patients developed a limb-length discrepancy, vs 12.8% of those with AOM ($p < 0.0001$) and 4.4% of those with ASA ($p < 0.0001$). Long-term orthopedic follow-up (≥ 1 year) was more often required in children with COM (14.0% of subjects) than in those with AOM (4.8%, $p < 0.0001$) or ASA (2.5%, $p < 0.0001$).

Conclusions Chronic osteomyelitis is associated with the worst morbidity of all pediatric osteoarticular infections. Further study into this condition is warranted.

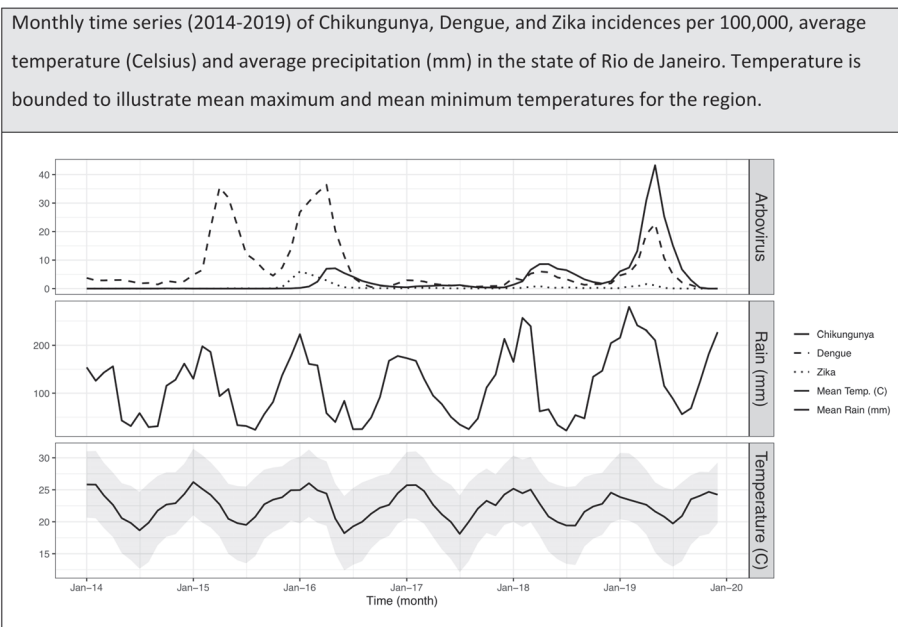
83 RE-EMERGENCE OF ARBOVIRUS DISEASES IN THE STATE OF RIO DE JANEIRO, BRAZIL 2014–2019

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10.1136/jim-2021-WRMC.83

Purpose of Study Cyclic re-emergence of arboviruses has been attributed to the dynamic interplay among the human population, environment, and mosquito vector. We sought to determine how seasonal arbovirus outbreaks change population conditions to impact circulation of Chikungunya, Dengue, and Zika.

Methods Used We assessed the spatial and temporal distributions of Chikungunya, Dengue, and Zika cases from the Brazil's national notifiable disease information system (SINAN) and precipitation and temperature data from WorldClim. We adapted a vector-host compartmental model to evaluate the effects of human population dynamics and the environmental on arbovirus risk to understand current patterns.



Abstract 83 Figure 1

Summary of Results 424,829 clinical cases of Chikungunya, Dengue, and Zika, with 0.15% mortality, were reported in Rio de Janeiro, Brazil from 2014–2019. Each year, we estimate that these arboviruses were associated with an average of 10,211 lost Disability-Adjusted Life Years. Of the clinical cases, 42,636 (30%) Chikungunya, 84,836 (41%) Dengue, and 5,962 (7.8%) Zika were laboratory confirmed. Overall, cases were high in 2015–2016, plummeted in 2017–2018, and resurged in 2019. Outbreaks commonly occurred after large rainfall events. Our models showed that the observed transmission patterns were better explained by human population dynamics than climate variations.

Conclusions Dynamic arbovirus patterns in Rio de Janeiro may be related to vector control interventions, human demographic processes, or temporary cross immunity. Mechanistic modeling may help predict future predominance of certain arbovirus species.

84 RISE IN SERUM MAGNESIUM LEVELS IN HOSPITALIZED PATIENTS INFECTED WITH COVID-19

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10.1136/jim-2021-WRMC.84

Purpose of Study Hypermagnesemia is an uncommon electrolyte disorder. It occurs in approximately 10% to 15% of hospitalized patients with renal failure. In the care of 108 COVID-19 infections admitted to Kern Medical an increase in serum magnesium was noted. 108 records were reviewed. 43 did not have hypermagnesemia (≥ 2.5 mg/dL) and 65 did. Renal dysfunction (AKI) was noted in 12 (18%) patients with average GFR - 100.75 mL/min. The records of the remaining 53 patients were evaluated. Correlation was made between serum magnesium and severity of disease.

Methods Used IRB approved this study. Patients included were diagnosed with SARS-CoV-2 and admitted from March 13 to July 15, 2020. Extracted data included demographics, medical history, and laboratory data including magnesium. 53 inpatients with increased magnesium were reviewed for oxygen requirement, intensive care, ventilator support and death.

Abstract 84 Table 1 SYMPTOMS (n=53)

| FEVER | 89% (47) |
|---------------------|----------|
| COUGH | 91% (48) |
| SHORTNESS OF BREATH | 91% (48) |
| DYSGEUSIA | 7% (4) |
| ANOSMIA | 4% (2) |
| DIARRHEA | 17% (9) |

Abstract 84 Table 2 Comorbidities (n=53)

| HYPERTENSION | 46% (24) |
|--------------|----------|
| DIABETES | 40% (21) |
| TUMORS | 6% (3) |

Abstract 84 Table 3 Treatment

| | HYPERMAGNESEMIA (n=53) | NON-HYPERMAGNESEMIA (n=43) |
|------------|---------------------------|-------------------------------|
| DECADRON | 79% (51) | 42% (18) |
| REMEDSIVIR | 37% (24) | 23% (10) |
| PLASMA | 74% (48) | 60% (26) |

Abstract 84 Table 4 Outcomes

| | HYPERMAGNESEMIA (n=53) | NON-HYPERMAGNESEMIA (n=43) |
|------------|---------------------------|-------------------------------|
| ICU | 59% (38) | 18% (8) |
| VENTILATOR | 28% (15) | 0 |
| DEATH | 20% (13) | 7% (3) |

Summary of Results 53 admitted patients with COVID-19 and hypermagnesemia and 43 without hypermagnesemia did not reveal AKI. Of the 53 patients, the average age was 50 years. 21 (40%) were females. All 53 patients had findings of bilateral opacities on radiographic imaging. Symptoms, comorbidities, treatment and outcomes are displayed in tables 1,2,3 and 4.

Conclusions We studied the correlation between elevated serum magnesium and outcome in admitted patients with COVID-19. We believe serum magnesium is another hallmark of disease severity.

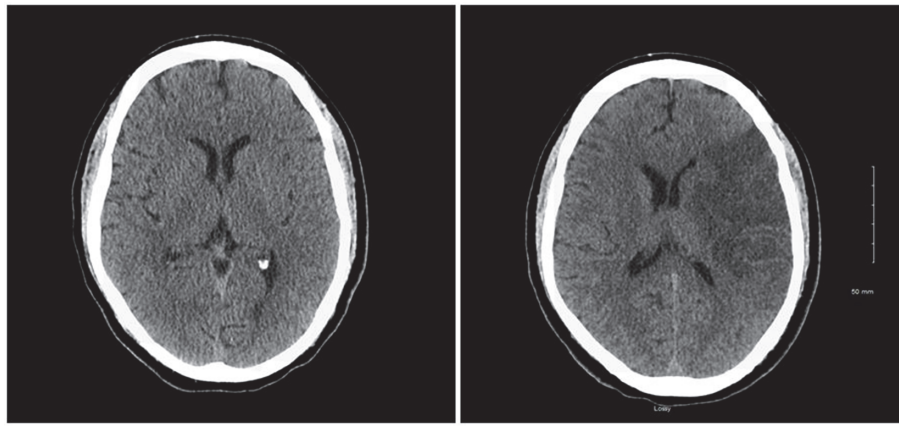
85 CAROTID ARTERY THROMBOEMBOLISM IN THE SETTING OF SARS-COV-2 POSITIVE HYPERCOAGULABILITY

C Spates*, A Tran, T Schainker, F Espinoza, H Huth. *West Suburban Medical Center, Oak Park, IL*

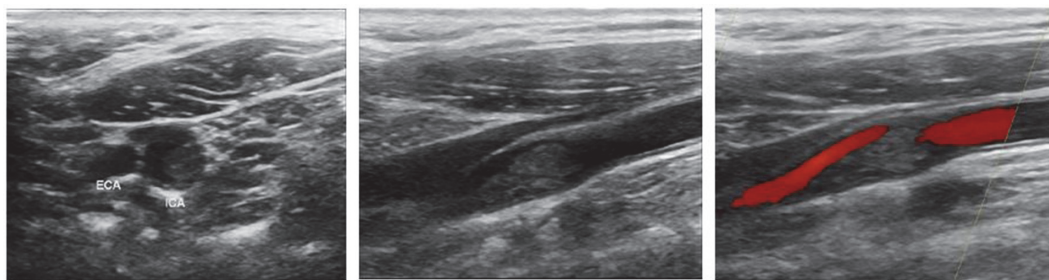
10.1136/jim-2021-WRMC.85

Case Report SARS-COV-2 hypercoagulability is now a commonly observed complication in severely ill patients. This state of hypercoagulability leads to venous and arterial, large and small vessel thrombotic disease through a number of pathways. These pathways are discussed as well as the potential role of point-of-care thromboelastic assays to monitor dynamic changes in coagulopathy.

A 38 yo male with history of seizures was admitted after being found unresponsive at home. NIH stroke scale was 14 for altered mental status, right-sided weakness and dysarthria. CT head was negative for acute stroke or bleed and the patient was given tPA. Carotid ultrasound revealed a large thrombus at the carotid bifurcation. Heparin infusion was started and patient was taken for emergent thrombectomy by the vascular surgeon. The patient was found to be positive for SARS-COV-2 IgM, IgG and PCR. Repeat CT head without contrast at 48-hour interval revealed a large MCA infarct. Aspirin, clopidogrel and atorvastatin were started. Workup for other causes of hypercoagulable state was unremarkable. On hospital day 8 patient had worsening mental status and decreased responsiveness with fixed, dilated pupils. The



Abstract 85 Figure 1



Abstract 85 Figure 2

patient quickly deteriorated and expired. It is postulated that the patient underwent hemorrhagic conversion of his ischemic stroke leading to his death.

Given projected growing number of COVID-19 infected patients with arterial and venous thromboembolic disease, thromboelastic point-of-care monitoring could provide a rapid monitoring to reduce COVID-19-related vascular and anti-thrombotic complications.

86

PROTECTING NEWBORNS FROM PERTUSSIS: WHAT ONLINE PROFESSIONAL WEBSITES SAY ABOUT TDAP

K Lee*, S Feng, T Le*, J Maticotta, AL Nelson. *Western University of Health Sciences, Pomona, CA*

10.1136/jim-2021-WRMC.86

Purpose of Study Tdap is a combination vaccine for three different bacterial diseases – tetanus, diphtheria, and pertussis. Pertussis, especially, can be a life-threatening disease for newborns because they rely on passive transfer of maternal antibodies and immunization of others they will contact until they are old enough to be vaccinated. Often, pregnant women search medical advice and information online before and/or after visiting a medical professional. The objective of this study was to estimate the accuracy and completeness of the information provided on professional or organizational websites about Tdap.

Methods Used To investigate this objective, we graded websites that posted advice by a medical advisor or

representing hospitals or other experts on their accuracy and completeness using the CDC guidelines as the gold standard. The CDC specifies which vaccine to use and when to administer and emphasizes the importance of making certain that all those who will come in contact with the newborns are up-to-date with their pertussis vaccination - a condition that CDC calls ‘cocooning’. A desktop search using Google search engine was performed starting in May, 2020 and ending August, 2020, using the following keywords: ‘Tdap during pregnancy’ and ‘Pertussis vaccination in pregnancy’. The automatically generated results were used to identify experts’ websites from the first 15 pages. The websites that required subscriptions, based its information on standards outside of the U.S., presented research paper format, or contained its information on a video were not included in the study. Our target was 100 sites.

Summary of Results Out of the 100 scored expert websites, 33 websites offered correct and complete information and 4 websites offered information that was both incomplete and incorrect. Out of 67% websites that were missing some information coverage, 52% were missing information regarding cocooning strategy. We also noted that more visited websites that appear on the front pages of Google search engines or more recently updated websites did not necessarily have the most accurate and complete information.

Conclusions This study shows that doctors need to counsel their patients carefully about which websites to consult for its accuracy and completeness and provide them concrete advice about cocooning.

87

A NOVEL COMPOUND WITH ANTIMICROBIAL ACTIVITY AGAINST STAPHYLOCOCCUS AUREUS

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10.1136/jim-2021-WRMC.87

Purpose of Study Antibiotic resistance in bacteria is becoming a growing concern in the health care industry, causing greater than 32,000 deaths and over 2 million bacterial infections yearly in the USA alone. One way to combat this ardent threat to public health is by studying the antimicrobial properties of a variety of novel compounds. Triazolodiazepines are an underexplored bicyclic skeleton with numerous pharmacologic activities. We hypothesized that among this class of compounds, antimicrobial hit compounds can be identified. Our confidence underlying the hypothesis stems from the fact that the triazole nucleus is a common and integral feature of a variety of natural products and medicinal agents, including some with antifungal and antimicrobial activity.

Methods Used A one-pot organic synthesis scheme was employed to generate a number of novel triazolodiazepine derivatives and related compounds. Antimicrobial activities of 20 novel compounds against *Staphylococcus aureus* were assessed by Kirby-Bauer disk diffusion assays following Clinical & Laboratory Standards Institute guidelines. The minimal inhibitory concentrations (MIC) of the most promising compound was tested utilizing micro-broth dilution assays against methicillin-resistant *S. aureus*.

Summary of Results Antimicrobial screening of the 20 compounds identified a single one with antibacterial activity against methicillin-resistant *S. aureus*. This compound was subjected to micro-broth dilutions assays, revealing killing activity in the microgram range. Similar activities were forthcoming against several other Gram-positive pathogens.

Conclusions A novel compound with promising antimicrobial activity against methicillin-resistant *S. aureus* and other Gram-positive pathogens was identified. Medicinal chemistry efforts are under way in order to improve this initial hit compound.

In addition, cytotoxicity studies and cellular target identification studies will be initiated

Neonatology general II

Concurrent session

10:10 AM

Friday, January 29, 2021

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OPTIMIZING CHEST COMPRESSIONS TARGETING GAS EXCHANGE IN NEONATAL CARDIAC ARREST

^{1,2}V Agrawal*, ¹S Gugino, ¹C Koenigsnecht, ¹J Helman, ¹M Rawat, ¹J Nair, ¹B Mathew, ¹S Berkelhamer, ³D Sankaran, ¹P Rivera-Hernandez, ¹S Mani, ³S Lakshminrusimha, ¹P Chandraskharan. ¹University at Buffalo, Buffalo, NY; ²Loma Linda University Adventist Health Sciences Center, Loma Linda, CA; ³University of California Davis, Davis, CA

10.1136/jim-2021-WRMC.88

Purpose of Study We hypothesized that feedback from a respiratory monitor (RM) that displays respiratory rate (RR) and exhaled carbon dioxide (ETCO₂) could help target the chest compressions (CC) rate and depth as recommended by neonatal resuscitation program (NRP).

Methods Used In an ovine cardiac arrest model, 1/3rd depth was predetermined. During CC a depth of 1/3rd and ETCO₂ levels of >7 mmHg was targeted with the use of RM. Resuscitation per NRP with epinephrine was continued till return of spontaneous circulation (ROSC) or until 20 min. ROSC was defined as a heart rate of >60 bpm with diastolic pressures >20 mmHg. We analyzed the peak carotid, pulmonary and coronary flows during CC based on ETCO₂ (≤5, 6–10, ≥11 mm Hg) and the CC depth achieved (<25%, 25–32%, 33%, 34–50%, >50%).

Summary of Results From 16 lambs, 11,375 CC events were analyzed with similar baseline characteristics. Carotid and pulmonary flows were higher with ETCO₂ ≥11 mmHg while

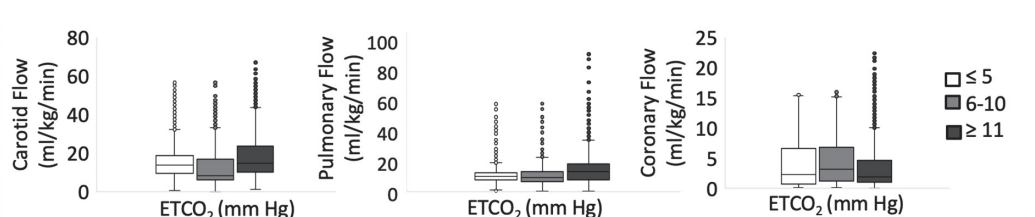


Figure 1a: Higher carotid and pulmonary flow with ETCO₂ ≥ 11, Higher coronary flow with ETCO₂ 6-10. (p<0.0001)

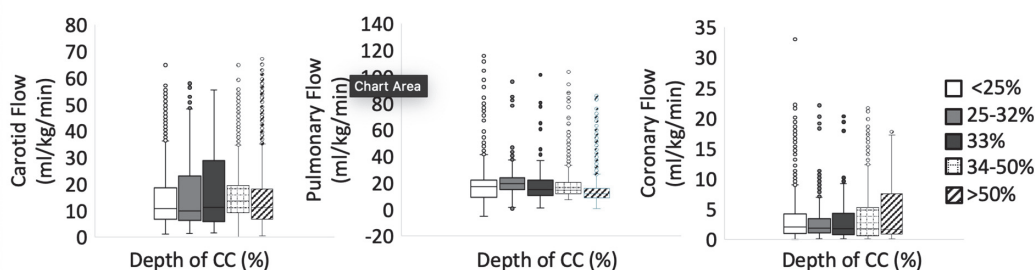


Figure 1b: Higher Carotid and Coronary Flow with 33% CC depth. Lowest Pulmonary Flow with >50% CC depth (p<0.0001)

Abstract 88 Figure 1

coronary flow was higher with ETCO_2 6–10 mmHg (Figure 1a). 33–50% depth of CC led to better carotid, pulmonary and coronary flows (Figure 1b). The use of a RM helped achieve 90 CC: 30 breaths per min during resuscitation along with the majority of CC between 33–50% depth. $\text{ETCO}_2 \leq 5$ mmHg was associated with no ROSC.

Conclusions Adequate gas exchange reflected by RM reflects perfusion to the lungs. Our findings support current NRP recommendations to target 1/3rd depth during CC although it is practically difficult. With the help of a feedback device like RM, targeting ETCO_2 of ≥ 6 mmHg could help achieve adequate perfusion in complete cardiac arrest.

89

COMPARISON OF PROCALCITONIN AND HIGH SENSITIVITY C-REACTIVE PROTEIN AS SCREENING TEST FOR LATE ONSET SEPSIS

A Vachhani*, A Chambliss, M Durand, R Ramanathan, R Cayabyab. LAC+USC Medical Center, Keck School of Medicine of USC, Los Angeles, CA

10.1136/jim-2021-WRMC.89

Purpose of Study To compare procalcitonin (PCT) and high sensitivity C-reactive protein (hsCRP) as screening tests for late onset sepsis (LOS).

Methods Used Retrospective study of infants admitted to the neonatal intensive care unit at LAC+USC Medical Center from 2018–2020. Infants with one paired PCT and hsCRP values and blood, urine or CSF culture obtained after 72 hours of life were included. Demographics and laboratory results were collected. Infants were classified as healthy, infected (positive blood, urine or CSF culture) and presumed to be infected (negative culture with clinical signs and elevated biomarkers). Data were analyzed with Chi square, Kruskal Wallis and Spearman correlation coefficient. Sensitivity and specificity were calculated.

Abstract 89 Table 1 Demographics and comparison of biomarkers between groups

| | Healthy Infants N=46 | Infants with Presumed Infections N=12 | Infants with Confirmed Infections N=14 | P-value |
|--------------------------|-------------------------|--|---|---------|
| Gestational age (weeks)* | 37.4 (31.7, 39.4) | 34.4 (26.1, 36.6) | 37.5 (30, 39.1) | 0.07 |
| Birth weight (g)* | 2580 (1400, 3255) | 1602 (760, 2150) | 2352 (1310, 3255) | 0.06 |
| hsCRP (mg/L)* | 0.45 (0.3, 1.7) | 15.6 (0.95, 48.8) | 27.65 (4.6, 79.9) | <0.001 |
| PCT (ng/mL)* | 0.14 (0.11, 0.19) | 1.83 (0.5, 10.72) | 1.90 (0.26, 5.54) | <0.001 |

*Median (25th percentile, 75th percentile)

Abstract 89 Table 2 Comparison of Biomarkers

| | PCT (0.5 ng/mL) | hsCRP (10 mg/L) |
|-------------------------------|-----------------|-----------------|
| Sensitivity (%) | 64 | 57 |
| Specificity (%) | 98 | 95 |
| Positive Predictive Value (%) | 90 | 80 |
| Negative Predictive Value (%) | 90 | 88 |

Summary of Results A total of 72 infants met inclusion criteria. Nineteen infants were admitted from labor and delivery and 53 from the emergency department. There were 14/72 (19.4%) infants documented to be infected. There was no difference in demographics between the three groups. PCT and hsCRP were highest in the infected group (table 1). PCT and hsCRP levels were moderately correlated ($r=0.64$, $p<0.0001$). The sensitivity, specificity, positive predictive value and negative predictive value of PCT was slightly higher than hsCRP (table 2).

Conclusions Our preliminary findings indicate that PCT and hsCRP can be used to screen infants for LOS. However, PCT may be a better diagnostic test to help identify infants at risk of serious bacterial infection. Additional studies are needed in very preterm infants.

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EFFECTS OF POSTNATAL STEROIDS ON TOTAL BRAIN VOLUME IN PRETERM INFANTS

¹JJ Keel*, ²LK Lee, ¹W Surento, ¹M Shiroishi, ¹N Jahanshad, ¹R Ramanathan, ¹R Cayabyab. ¹LAC+USC, Los Angeles, CA; ²Kaiser Foundation Hospital, Fontana, CA

10.1136/jim-2021-WRMC.90

Purpose of Study To determine if the use of postnatal steroids (PS) in premature infants is a risk factor for smaller total brain volume

Methods Used Retrospective review on all preterm infants <1250 grams at birth who had magnetic resonance imaging (MRI) of the brain performed prior to hospital discharge from 2009–2014. MR images were manually masked by neuroanatomical experts to remove non-brain tissue and obtain an

Abstract 90 Table 1 Demographics and outcomes between the 4 groups

| | No steroids (n=55) | Hydrocortisone (n=31) | Dexamethasone (n=11) | Combined (n=30) | P-value |
|--|--------------------------|--------------------------|-------------------------|--------------------|---------|
| Gestational age (weeks)* | 28 (27, 30) | 25 (24, 27) | 26 (25, 27) | 25 (24, 26) | <0.001 |
| Birth weight (grams)* | 925 (808, 1030) | 665 (555, 830) | 755 (615, 1090) | 640 (545, 780) | <0.001 |
| Male sex, n (%) | 24 (44) | 16 (52) | 5 (45) | 21 (70) | 0.13 |
| Antenatal steroids, n (%) | 52 (95) | 28 (93) | 10 (91) | 28 (97) | 0.87 |
| Bronchopulmonary dysplasia, n (%) | 25 (45) | 26 (84) | 11 (100) | 30 (100) | <0.001 |
| Intracranial hemorrhage, n (%) | 20 (36) | 22 (71) | 8 (73) | 26 (87) | <0.001 |
| Severe retinopathy needing intervention, n (%) | 0 | 8 (26) | 1 (9) | 16 (53) | <0.001 |
| Brain volume (mm ³) | 315 (295, 338) | 316 (301.5, 352) | 330 (279, 345) | 311 (279, 376) | 0.88 |
| Postmenstrual age (weeks)* | 37 (36, 38) | 38 (37, 39) | 39 (37, 42) | 39 (37, 41) | 0.02 |

*Median (25th, 75th percentile)

estimate of overall brain volume (BV). Data on maternal and neonatal demographics, clinical characteristics and MRI results were collected. Infants were divided into 4 groups: those who received no steroids, only hydrocortisone, only dexamethasone, or combined. Data was analyzed using Kruskal-Wallis and Chi Square or Fischer Exact test and Linear regression.

Summary of Results One hundred and twenty-seven preterm infants met inclusion criteria. The more immature, smaller and medically complex infants with bronchopulmonary dysplasia, severe retinopathy of prematurity, and intracranial hemorrhage received PS. There was no significant difference in BV of infants between the 4 groups however infants receiving PS had MRIs obtained at a later postmenstrual age (table 1). After adjusting for confounders, the presence of intraventricular and cerebellar hemorrhage (intracranial hemorrhage) was the only morbidity negatively associated with total brain volume (Coef. -38, 95% CI -57 to -20, $p \leq 0.001$) and not the use of PS (Coef. 4.9; 95% CI 0 -3.9, 13.74 $p = 0.27$).

Conclusions The presence of any intracranial hemorrhage adversely affected the BV but not the use of PS in this extremely high risk preterm population. Referral for early intervention and close follow up is necessary after hospital discharge.

91 VIRTUAL FAMILY CENTERED ROUNDS IN THE NEONATAL INTENSIVE CARE UNIT: A PILOT STUDY

J Ranu*, K Hoffman, H Sauer-Ford, J Williams, JL Rosenthal. *University of California Davis, Davis, CA*

10.1136/jim-2021-WRMC.91

Purpose of Study Family Centered Rounds (FCR) are multidisciplinary bedside rounds with active family engagement and are standard of care in pediatrics. Often, due to geographical distance, financial burdens, work obligations and family responsibilities, parents are unable to attend FCR in the Neonatal Intensive Care Unit (NICU). Our objective was to measure the feasibility of conducting a virtual FCR (vFCR) pilot trial.

Methods Used We conducted a 7-month two-arm randomized controlled pilot trial of hospitalized infants in the NICU. Infants were randomized to participate in vFCR (intervention) or standard bedside rounds (control) in a 2:1 ratio, respectively. We specified four *a priori* feasibility objectives for this pilot trial: (1) among intervention arm patients, use of the intervention at least once will be $\geq 75\%$; (2) among attempted vFCR connections, $\geq 90\%$ will have no technical issues; (3) the duration (minutes) of FCR encounters for the intervention arm will be no longer than the control arm; (4) parent-reported exploratory outcomes survey response rate will be $\geq 75\%$. Proportions and means were calculated for the feasibility objectives.

Summary of Results Among the 110 included infants, 74 were randomized to the intervention arm and 36 to the control arm. Of the 74 intervention arm infants, attendance at vFCR at least once occurred for 35 of these patients (47%). In total, the intervention was used by parents for 216 virtual rounding encounters. Among the 216 vFCR connection attempts, 94% occurred without technical issues. The median rounding time for intervention arm patients was 5.6 minutes (SD = 4.0) and the median rounding time for control patients was 6.0 minutes (SD = 4.2). Surveys were

completed by 82% of intervention patients and 75% of control patients at discharge.

Conclusions We successfully delivered the intervention of vFCR. Our feasibility data show that we met our objectives for minimal technical issues, no burden in rounding duration, and good survey response rate. We did not achieve our intervention uptake goal; however, the 216 vFCR encounters among the 35 intervention users supports good uptake among the users.

Adolescent medicine and behavior development II

Concurrent session

11:05 AM

Friday, January 29, 2021

92 EVALUATING MIDDLE SCHOOL STUDENTS' UNDERSTANDING OF TOPICS PERTINENT TO, AND EMOTIONAL OUTLOOK ON THE COVID-19 PANDEMIC

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10.1136/jim-2021-WRMC.92

Purpose of Study The COVID-19 pandemic interrupted the education of nearly 80,000 students throughout Denver Public Schools (DPS). This change lead to academic impairments and mental health challenges. The COVID Virtual Summer Camp was created to engage middle school students from DPS in discussions about topics pertinent to COVID-19 in an effort to increase understanding and decrease anxiety induced by the pandemic.

Methods Used Students were recruited to the virtual camp via email. Two camps were conducted with 55 participants. The camps took place July 13th- 24th, lasting 4 days each, with 4 hours of programming each day. Topics included microbiology, immunity, health disparities, and mental health. Emphasis was placed on the veracity of sources, and how to verify information found on social media. The mental health curriculum was introduced to help students recognize, label, and regulate emotions regarding the COVID-19 pandemic. Topics were presented using short lectures, small group discussions, and Q&A sessions with medical and public health professionals. Participants completed pre- and a post-camp surveys, assessing their level of understanding of topics pertinent to COVID-19 as well as their emotions associated with the pandemic. Participants chose words from a word bank to describe their emotions associated with the COVID-19 pandemic. Each word corresponded to a particular position on a pleasantness and energy intensity axes (RULER Mood Meter).

Summary of Results Completed pre- and post-camp surveys showed a 54.5% increase ($p < .00001$) in confidence discussing infectious diseases and a 40% increase ($p < .00001$) in self-reported knowledge about the spread of infectious diseases. Pre-camp surveys showed 62% of words chosen to describe emotions regarding the COVID-19 pandemic to be in the unpleasant, high-energy quadrant. The post-camp surveys found 67.5% of words selected to be in the same quadrant.

Conclusions The COVID Virtual Summer Camp increased self-reported knowledge and confidence in discussing infectious diseases. We demonstrated that the majority of emotions towards the pandemic were associated with higher energy and unpleasantness, regardless of level of understanding.

93 REDESIGNING THE DOOR REDUCES THE POTENTIAL FOR FINGER INJURIES IN CHILDREN

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Purpose of Study The standard door is a safety hazard for young children often resulting in crush injuries, nail avulsions, fractures, lacerations, and amputations. The purpose of this study is to redesign the door to reduce the risk of finger injuries in children.

Methods Used A safety door was designed and a model of it was constructed for study. Its two major features utilize silicone rubber fins at the pinch points and a ‘piano’ hinge running the entire door length (instead of the conventional two or three separate hinges) to eliminate the space between the hinges. Ten door slams using five finger models (beef stick, green beans, string cheese, crayons, red licorice twists) were performed to observe and assess the resulting injuries from the safety door compared to a standard door. The severity of the resulting injuries were scored using a 0 – 8 numerical score.

Summary of Results The safety door resulted in 1 amputation (0.7%) compared to 120 amputations in the standard door

Abstract 93 Table 1 Mean injury scores (SD) and 95%CIM in each of the doors using various models. *Not applicable because the safety door’s piano hinge eliminates this possible injury

| | Safety Door (Mean) | Safety Door (95%CIM) | Standard Door (Mean) | Standard Door (95%CIM) |
|---------------------------------------|--------------------|----------------------|----------------------|------------------------|
| Hinge side of door (inside to out) | N/A* | N/A* | 5 (2.5) | 4.3 to 5.7 |
| Hinge side of door (outside to in) | 0.1 (0.6) | -0.03 to 0.3 | 5 (2.5) | 4.3 to 5.7 |
| All hinge side of door | 0.1 (0.6) | -0.03 to 0.3 | 5 (2.5) | 4.5 to 5.5 |
| Doorknob side of door (inside to out) | 0.1 (0.7) | -0.1 to 0.3 | 4.6 (0.8) | 4.4 to 4.8 |
| Doorknob side of door (outside to in) | 0.2 (0.4) | 0.1 to 0.3 | 4.6 (0.8) | 4.4 to 4.8 |
| All doorknob side of door | 0.2 (0.6) | 0.05 to 0.3 | 4.1 (0.6) | 4.5 to 4.8 |
| All both sides of door | 0.2 (0.6) | 0.1 to 0.2 | 4.8 (1.9) | 4.5 to 5 |

Abstract 93 Table 2 Amputations in each of the doors using various models (10 trials per model item).

| | Safety Door Amputations | Standard Door Amputations |
|-----------------------|-------------------------|---------------------------|
| Hinge side of door | 0/50 | 40/100 |
| Doorknob side of door | 1/100 | 80/100 |
| Both sides of door | 1/150 | 120/200 |

(60%, p<0.0001) and had significantly lower numerical injury scores (0.2 vs 4.8, p=0.0001).

Conclusions The safety door is less injurious than the conventional door and re-designing of the door will likely lower the risk of finger injuries in young children.

94 WHAT’S THE BEEF? EMPOWERING YOUTH TO ADDRESS BULLYING THROUGH ART

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10.1136/jim-2021-WRMC.94

Purpose of Study Although bullying is one of the most significant public health concerns for adolescents worldwide, school bullying prevention programs have been generally unsuccessful. Since adolescents generally listen more to their peers than to adults, we partnered with high-risk minority adolescents in a ‘youth-as-partner’ approach to increase awareness of bullying through innovative peer-led means.

Methods Used UC Davis medical students and UCSF-Fresno Department of Pediatrics collaborated with the Men’s Alliance Programs at a local middle and high school to create a feeder program between the schools. Anonymous surveys and focus groups were used to ascertain student knowledge and awareness of bullying on campus, its psychosocial effects, and how to prevent or respond to bullying. Through peer-led focus groups, students defined the concepts of ‘bullying’ vs ‘beef’, with the term ‘beef’ new to the medical students and their supervising physicians. Middle school students shared their personal experiences with peers through the creation and performance of rap lyrics, while high school students wrote letters to mentor their middle school peers.

Summary of Results Of 71 students who completed the survey, 35% reported having been bullied, while 2.7% reported having bullied someone else. They were bullied about their size (21%), friends (10%), and how they talked (8%), with bullying occurring in the classroom (17%), hallway (10%), and other unspecified places (28%). 35% of students felt that more than 50% of students on campus were bullied, while 8% believed that bullying happened to more than 75% of students. 17% of students were ‘strongly familiar’ with school anti-bullying services and 40% were ‘not familiar’. The student-written rap lyrics and letters were made into an electronic book for faculty, students, and physicians to view.

Conclusions Adolescents were empowered to raise awareness of bullying through music and letter writing, defining bullying as about dominance, whereas beef was defined as a ‘glorified’ and ‘respected’ altercation between two equal persons. Although high-risk minority adolescents can successfully identify and address these two concepts within their own lives, physicians may need to differentiate between the two when discussing these concepts with their adolescent patients.

95 WALKABILITY OF SAN BERNARDINO COUNTY’S ELEMENTARY SCHOOLS IN RELATION TO SCHOOL DISTRICT SIZES

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10.1136/jim-2021-WRMC.95

Purpose of Study Studies estimate that children get half of the recommended hour of physical activity throughout the school day. This study evaluates the relationship between the walkability loops around elementary schools in San Bernardino County's (SBC) school districts and the districts' sizes. This relationship is then used to determine if district size is a good diagnostic tool to decide which districts need increased resources allotted to families for exercise.

Methods Used Using Google Maps, two walking loops were scored, using a modified version of the Center for Disease Control's Walkability Audit Tool. The school's highest value was used. Districts with 16 or more schools were compared to districts with less than 16 schools. Process was repeated with ten schools and five schools as thresholds. A Chi-Square calculator was used to analyze the data.

Summary of Results District size was not shown to have an impact on the corresponding average loop score.

Conclusions Low loop scores indicate that walking around the school for exercise is not feasible. Therefore, more resources should be provided to make their schools more fitness-friendly. The results above demonstrated that district size should not determine which schools need more physical activity resources because any district is susceptible to having low loop scores. Future research may reveal correlations between schools' academic success and students' physical activity.

| | Districts with Loops < 70 | Districts with Loops ≥ 70 | Marginal Row Totals |
|-----------------------------|---------------------------|---------------------------|---------------------|
| Districts with < 16 schools | 15 (14) [0.07] | 6 (7) [0.14] | 21 |
| Districts with ≥ 16 schools | 5 (6) [0.17] | 4 (3) [0.33] | 9 |
| Marginal Column Totals | 20 | 10 | 30 (Grand Total) |

The chi-square statistic is 0.7143. The p-value is .398025. Not significant at $p < .05$.

The chi-square statistic with Yates correction is 0.1786. The p-value is .672604. Not significant at $p < .05$.

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| | Districts with Loops < 70 | Districts with Loops ≥ 70 | Marginal Row Totals |
|-----------------------------|---------------------------|---------------------------|---------------------|
| Districts with < 10 schools | 12 (10.67) [0.17] | 4 (5.33) [0.33] | 16 |
| Districts with ≥ 10 schools | 8 (9.33) [0.19] | 6 (4.67) [0.38] | 14 |
| Marginal Column Totals | 20 | 10 | 30 (Grand Total) |

The chi-square statistic is 1.0714. The p-value is .300623. Not significant at $p < .05$.

The chi-square statistic with Yates correction is 0.4185. The p-value is .517673. Not significant at $p < .05$.

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| | Districts with Loops < 70 | Districts with Loops ≥ 70 | Marginal Row Totals |
|----------------------------|---------------------------|---------------------------|---------------------|
| Districts with < 5 schools | 8 (7.33) [0.06] | 3 (3.67) [0.12] | 11 |
| Districts with ≥ 5 schools | 12 (12.67) [0.04] | 7 (6.33) [0.07] | 19 |
| Marginal Column Totals | 20 | 10 | 30 (Grand Total) |

The chi-square statistic is 0.2871. The p-value is .592097. Not significant at $p < .05$.

The chi-square statistic with Yates correction is 0.0179. The p-value is .893442. Not significant at $p < .05$.

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Abstract 95 Figure 1

96 JUST-IN-TIME TRAINING FOR VIDEO LARYNGOSCOPY IN PEDIATRIC INTUBATIONS

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Purpose of Study Video laryngoscopy (VL) may augment pediatric intubations outside the operating room (OR). Training methods for skill development vary. We aimed to describe use of and intubation complications with VL before and after the implementation of a VL just-in-time-training (JITT).

Methods Used We performed a retrospective chart review of non-OR intubations at a single hospital from January 2015 to March 2020. Intubation procedure notes were reviewed and data were collected on patient age, intubation method, operator characteristics, adverse events, number of attempts, and hospital department. The data were separated into pre-JITT (January 1, 2015-April 31, 2018) and post-JITT (May 1, 2018-March 1, 2020) periods. Our institutional review board deemed this study exempt. The change in VL use pre- and post-JITT was tested using Fisher's exact test. Descriptive statistics were used comparing pre- and post-JITT complications of intubations with multiple attempts (IMAs) and intubations with 1 or more adverse event (AE).

Summary of Results A total of 268 patients were intubated during the study period; 231 were pediatric patients. Among pediatric patients, 154 pre-JITT intubations and 77 post-JITT intubations were documented. Pre- and post-JITT VL use was 17(11%) and 17(22%), respectively ($p=0.03$). Pre-JITT, pediatric intubations in the emergency department (ED) and pediatric intensive care unit (PICU) numbered 72(49%) and 74(50%) with 12(16%) and 5(7%) intubations using VL. Post-JITT, pediatric intubations in the ED and PICU numbered 32(42%) and 44(58%), with 14(44%) and 3(9%) intubations using VL. In pre-JITT VL, there were 2(12%) IMAs and 0(0%) intubations with 1 or more AE. In post-JITT VL, there were 3(18%) IMAs and 1(6%) intubation with 1 or more AE.

Conclusions VL use for pediatric intubations increased in the ED and PICU from pre- to post-JITT. The infrequency of pediatric intubations makes drawing significant conclusions regarding the impact on IMAs and AEs challenging. JITT shows the potential to increase VL use for pediatric intubations outside the OR but a decrease in complications was not observed.

97 THE EFFECT OF PARENTAL INCOME ON CHILDREN'S BMI

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10.1136/jim-2021-WRMC.97

Purpose of Study Childhood obesity is a known epidemic that poses a concerning health and wellness consequence to children now and for their future health as adults. Childhood unhealthy weight is defined as a BMI > 85%ile. Normal BMI range fall between 5–85%ile for children less than 17.9 years. Combating this epidemic is difficult often due to complex

socioeconomic contributors (Maziak, et al. 2008). Families with lower financial resources report having increased difficulty providing healthy meals for their family. These factors can increase the chance of the children becoming overweight or obese. This study aims to find a correlation between families with low incomes (less than \$10,000–19,000) having children with a high BMI (>85%ile) compared to children with a healthy BMI (<85%ile).

Methods Used Children identified as overweight or obese (BMI>85%ile) from a federally qualified community pediatric clinic were referred to attend a daily week long ‘Operation Fit Camp’ in Loma Linda, CA. At this camp, the parents answered questions regarding annual income. The BMI of the child camper was recorded.

Summary of Results The sample size was N=639. Odds ratio and Chi-square statistics were calculated and showed that children with healthy BMI were 44% more likely to have low income parents than children with a high BMI [X^2 (1, N = 639), $p = 0.041$].

Conclusions Even though these results did not line up with previous literature, 71% of the children in the sample size had an elevated BMI. These were the results from a sample size in San Bernardino County, further studies should continue to explore the aspects affecting childhood obesity.

98 DRUG USE AND THE DESIRE TO QUIT AMONG YOUTHS EXPERIENCING UNSTABLE HOUSING

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10.1136/jim-2021-WRMC.98

Purpose of Study Drug use has been noted as a significant problem among homeless youth populations. Within those populations, youth can be further classified by age and gender. The goal of this study is to determine the most at risk demographic characteristics for ‘drug use’ in homeless youth and the demographic characteristics for youth that are ‘most wanting help quitting drugs’.

Methods Used Surveys were distributed to homeless youth at first arrival for a day program at YouthHope Foundation in Redlands, CA. These surveys included demographic, social, and educational information questions. Data from these surveys was used to examine ‘drug use’ and the ‘desire to quit’ among the youth.

Summary of Results The results of the surveys showed that statistically significant difference existed in drug use between youth differentiated by age: Female minor vs female adult ($p<.00001$) and male minor vs male adult ($p<.00001$) as well as their desire to quit ($p<.00271$ female age groups, $p<.01093$ male age groups). This indicated that female minors are at 45% lower odds for drug use, but also at 25% lower odds for wanting to quit than female adults. Male minors are at 42% lower odds for drug use, but also at 38% lower odds for wanting to quit than male adults.

However there was no significant difference in drug use based on gender: Male adult vs female adult ($p=.363539$), male minor vs female minor ($p=.513002$), and male vs female ($p=.129936$), or in their corresponding desires to quit ($p=.596082$, $p=.647921$, $p=.356779$ respective groups).

Conclusions It appears that there is a correlation between drug use and aging, as well as aging and a desire to quit.

This is not unexpected as drug exposure increases the longer youths are on the streets. It is insightful to note that older adults as a whole exhibit a stronger desire to quit. Further research is needed to determine if there are further correlations between increased desire to quit and certain drugs.

Endocrinology and metabolism I

Concurrent session

11:05 AM

Friday, January 29, 2021

99 DIABULIMIA: THE HIDDEN EATING DISORDER

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10.1136/jim-2021-WRMC.99

Background Diabulimia is a condition where a person with diabetes restricts insulin use to lose weight. Diagnosis and treatment of diabulimia or other eating disorders in diabetic patients can be challenging as patients often have poor insight about their condition and are unwilling to pursue treatment.

Clinical Case A 22-year-old woman presented with nausea, vomiting, and abdominal pain. She was found to be in diabetic ketoacidosis (DKA) with a HbA1c >15%. Her past medical history was notable for chronic idiopathic pancreatitis requiring total pancreatectomy and islet cell transplantation. She subsequently developed post-pancreatectomy diabetes, likely due to glucose toxicity of the transplanted islet cells. She was started on an insulin drip and transitioned to subcutaneous insulin when the DKA resolved. Her insulin doses decreased as her glucose toxicity improved, but her abdominal pain persisted and she was noted to have bingeing/purging episodes. She was evaluated by psychiatry who was concerned for anorexia with purging, and they initially determined that she did not have capacity to leave against medical advice due to poor insight. After multiple conversations with the primary team, endocrinology, psychiatry, and social work, she eventually admitted to an eating disorder and acknowledged withholding of insulin therapy. Due to showing some acceptance of her condition with a modest improvement in accepting therapy while in the hospital, she was then determined to have capacity to decide if she wanted further inpatient treatment. She declined an inpatient eating disorders program and was discharged on subcutaneous insulin.

Conclusion This case illustrates the complex challenges associated with diagnosing and treating diabetic patients which can include medication noncompliance, diabulimia, and concomitant eating disorders. Although this patient eventually admitted to having an eating disorder, she still declined treatment and is at significant risk for continuing poor glycemic control, which can result in future complications. Recognition of eating disorders in diabetic patients is critical to institution of appropriate therapy. Management requires a multidisciplinary approach between the diabetic team and mental health services.

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RETROSPECTIVE ANALYSIS OF TOTAL PANCREATCTOMY WITH ISLET AUTO TRANSPLANTATION OUTCOMES IN PEDIATRIC PATIENTS WITH CHRONIC PANCREATITIS

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Purpose of Study Total pancreatectomy with islet auto transplantation (TPIAT) is a potentially curative treatment for patients with chronic pancreatitis (CP) refractory to medical and endoscopic therapies. Outcomes of patients who have undergone TPIAT are limited to single center follow-up. We characterized the traits and outcomes of pediatric patients in Colorado who underwent TPIAT.

Methods Used We analyzed data of 9 pediatric patients who underwent TPIAT at the University of Minnesota over 13 years. We collected baseline and follow-up data of insulin total daily dose (TDD), HbA1c, c-peptide, BMI and weight, pancreas related hospitalizations, narcotic use, mental health, and nausea. Data are shown as mean±SD.

Summary of Results Patients presented with CP at age 7.6±4.9 years. All patients presented with a genetic cause of CP: 6/9 PRSS1, 2/9 CFTR and one with PRSS1 and CFTR. Patients had 2.7±1.5 ERCPs prior to TPIAT and underwent TPIAT at 11±3.1 years. Islet mass transplanted was 5260±2663 IEQ/kg. Subjects had a follow-up of 4.63±3.6 years. Intestinal complications and surgical revision was required by 3/9.

No patients used insulin prior to TPIAT. At least 6 months post-TPIAT, 7/9 patients required insulin therapy with 5/9 still requiring treatment with subcutaneous insulin. At most recent follow up, TTD was 0.3±0.3 units/kg.

For those whom data was available (7/9) prior to TPIAT, average HbA1c was 5.3±0.3. Average HbA1c at 1 year post TPIAT was 5.9±0.8. Average HbA1c at most recent follow up was 6.7±1.7%. Of note, 4/9 patients have HbA1c's >6.5%.

Data on active narcotic prescriptions was available for 8/9 patients. Prior to TPIAT 8/8 patients required narcotics for pain control, post TPIAT, 4/8 keep an active narcotic prescription.

Conclusions In the 9 known pediatric TPIAT patients in Colorado, all had genetic mutations for CP. More than half require insulin after TPIAT, but at a relatively low TDD. This may suggest endogenous graft insulin production and 4/9 patients have HbA1c's in the non-diabetic range. Patients have reduced narcotic usage post-TPIAT as half of patients have a current active narcotic prescription.

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HYPERCALCEMIA HERALDS POOR OUTCOMES IN MULTIPLE MYELOMA

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Purpose of Study Multiple Myeloma (MM) is often complicated by hypercalcemia of malignancy (HCM). Severe hypercalcemia is known to cause a variety of complications, as well as decreased survival. The degree of hypercalcemia among

patients with MM can occur across a wide spectrum and may have variable effects on patient-related outcomes. Thus, we aimed to investigate the role of HCM on relevant endpoints and comorbidities among patients with MM.

Methods Used De-identified patient data were obtained from the UNM Electronic Medical Record (EMR) Data Repository. A total of 717 individuals with an ICD-9/10 diagnosis of MM were identified from 2010 to 2019, and after exclusion criteria, 627 individuals remained. These were separated into two groups according to the presence (MM+HCM, n=54) or absence (MM-HCM, n=573) of HCM within 1 year of MM diagnosis. Clinical laboratory and outcome data were collected for 1 year after the diagnosis of MM, and the occurrence of specific comorbidities were collected using the entirety of the EMR data following diagnosis of MM. Binary logistic regression was used to assess the odds for clinical outcomes and common comorbidities between groups.

Summary of Results Patients in the MM+HCM category had significantly higher serum calcium concentrations (10.0 vs. 9.3 (mg/dL), $p < 0.001$) lower phosphate concentrations (3.2 vs. 3.5 (mg/dL), $p = 0.03$), and higher BUN levels (22 vs. 17 (mg/dL), $p = 0.02$) compared to those in the MM-HCM group. Hospital length of stay was significantly longer in the MM+HCM group (4.8 vs. 1.6 (days), $p < 0.0001$). The odds of readmission within 30 and 90 days of MM diagnosis was 2–3 fold higher in the HCM+MM group, and they had a mortality OR of 4.2 when compared to MM-HCM patients ($p < 0.0001$). Additionally, the odds of being diagnosed with heart failure, chronic kidney disease, acute renal insufficiency, or sepsis were significantly higher in the MM+HCM group compared to the MM-HCM group.

Conclusions Patients with MM and HCM demonstrate significantly worse clinical outcomes and a higher burden of comorbidities compared to MM patients without hypercalcemia. HCM may aide in prognostication and risk stratification for patients with MM.

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IMPAIRED DIETARY DECISION-MAKING IN YOUTH WITH CONGENITAL ADRENAL HYPERPLASIA

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10.1136/jim-2021-WRMC.102

Purpose of Study Youth with congenital adrenal hyperplasia (CAH) have an increased prevalence of obesity, early adiposity rebound, and increased fat mass compared to controls. The inability to control food desire could contribute to obesity, and understanding food-seeking behavior could guide prevention. Key brain regions implicated in reward and dietary decision-making, including limbic brain regions and prefrontal cortex, have been shown to be smaller in CAH patients. However, little is known about dietary behavioral manifestations of these brain differences in CAH. We therefore aim to study food choices in youth with and without CAH.

Methods Used 37 CAH youth (12.2 ± 3.1 years, 60% male, BMI-Z 1.6 ± 0.8) and 100 controls matched for age and sex

(11.7 ± 2.4 years, 57% male, BMI-Z 0.9 ± 1.2) completed a computer-based behavioral food choice task. They rated 30 high- and 30 low-calorie food cues for tastiness, healthiness, and preference for each food item. Youth then chose between food pairs discordant for tastiness and healthiness based on the individual's own ratings. A successful food-choice trial (i. e., successful self-control) was evident when the healthier food was chosen. Cursor-trajectory analyses measured the area under the curve (AUC) and maximum deviation time (MDT) per choice trial.

Summary of Results CAH and control youth did not display overall differences in their ratings of food cues (all $P > 0.30$) or in the percentage of total successful food choice trials ($P = 0.16$). However, CAH youth had larger average AUCs compared to controls [$T(135) = -2.15$; $P = 0.03$] for all choice trials, indicating greater cognitive conflict or increased cognitive effort during decision-making. In successful food choice trials, CAH youth had longer average MDTs [$T(102) = -2.59$; $P = 0.01$] indicating a later time window at which the final decision was made.

Conclusions CAH youth have similar evaluations of food but different decision-making performance in our behavioral task compared to control youth. Greater cognitive conflict during food choice could reflect factors inherent to CAH such as abnormal hormones or neural pathways regulating dietary self-control and reward.

103 ANALYSIS OF ENIGMA GENE-SIGNALING PATHWAYS IN THYROID CANCER

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10.1136/jim-2021-WRMC.103

Purpose of Study Fine-needle aspiration (FNA) is one of the most accurate modes of obtaining thyroid nodule biopsies, however, up to 25% of biopsies still yield indeterminate results. There is an increasing number of thyroidectomies due to indeterminate nodules by FNA alone. Therefore, more accurate and time efficient diagnostic approaches for analyzing indeterminate thyroid nodules is required. Recent studies showed that Enigma is associated with different cancer types, including thyroid cancer progression and calcification through its interaction with bone morphogenic protein-1 (BMP-1) and tyrosine kinases linked to mitogen-activated protein kinase (MAPK) signaling pathway.

Methods Used Our published data on Enigma protein analysis with immunohistochemistry showed promising findings to discriminate malignant versus benign nodules. We also showed a thyroid cancer stage-dependent enhancement of Enigma protein expression. In this study, we are investigating Enigma at a gene expression level by quantitative reverse transcription polymerase chain reaction (RT-qPCR), which is more time-efficient, quantitative, and requires less tissue than immunohistochemistry. We extracted mRNA/DNA/proteins from fresh malignant and benign thyroid nodules using a Qiagen AllPrep DNA/RNA/Protein Mini Kit. After verification of the quantity and purity by NanoDrop, isolated mRNA was then run through Enigma-RT-qPCR. MAPK assay was done by western blotting using MAPK-antibody.

Summary of Results Our initial results found that Enigma-mRNA expression level was 3-fold higher in malignant

compared to benign thyroid tissues. This finding supports our previous protein expression data with a relative quantitative difference in Enigma-mRNA expression level between malignant and benign thyroid nodules. MAPK expression was upregulated in thyroid cancer compared to benign nodules.

Conclusions We conclude that Enigma-RT-qPCR can be used effectively in FNA samples derived from thyroid nodules, which could potentially enhance the diagnostic accuracy of indeterminate nodules and decrease unnecessary thyroidectomies. Furthermore, both Enigma and MAPK were highly expressed in advanced tumor in the same tissues. Future study is needed to establish the functional interaction of Enigma-MAPK activity in thyroid cancer cells.

104 ONE MONTH OF SUPPLEMENTAL TESTOSTERONE DOES NOT SIGNIFICANTLY CHANGE THE METABOLOME IN TRANSGENDER MALES

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10.1136/jim-2021-WRMC.104

Purpose of Study Testosterone may be associated with cardiovascular disease (CVD) and recent studies suggest transgender males (TGM) on long-term exogenous testosterone have a higher risk of CVD than cisgender women but not men. We sought to determine whether there were significant changes in the metabolic/metabolomic profile in TGM adolescents receiving testosterone therapy.

Methods Used Ten TGM adolescents [Age 15.2 (14.6–16.3) years, BMI 21.5 (18.4–27.6) kg/m²] were evaluated prior to and after 1 month of exogenous testosterone treatment in a longitudinal observational study. Demographics, physical exam, fasting laboratory measurements were collected. HOMA-IR was calculated as an estimate of insulin sensitivity. Untargeted and targeted serum metabolomics were performed with mass spectrometry. Metabolomic profiles before and after treatment and correlated with clinical variables. T-tests or Mann Whitney U were used to compare variables pre-post treatment and change with treatment was calculated for correlations. Metabolomic data analysis was performed with MetaboAnalyst.

Summary of Results Per study design, participants had a significant change in total testosterone (250 ± 107 ng/dL, $p < 0.001$) and SHBG (-11.7 ± 7.8 mg/dL, $p = 0.004$) after treatment, although the cardiometabolic profile in terms of fasting total cholesterol (-1.50 mg/dL, $p = 0.82$), triglyceride (3.3 ± 17.3 mg/dL, $p = 0.84$), HDL (-0.5 ± 3.9 mg/dL, $p = 0.84$), glucose (-1.2 ± 7.1 mg/dL, $p = 0.81$) and HOMA-IR ($p = 0.92$) were unchanged. Principal component analysis indicated no significant difference in metabolomic profile with treatment. In the untargeted metabolomics analysis, the only significantly different metabolite was 2,3-Phospho-D-Glycerate. Exploratory analyses showed that increases in serum testosterone were associated with increases in several bile acids. Improvements in HOMA-IR were associated with increases in bile acids and several polyunsaturated fatty acids.

Conclusions Exogenous short-term testosterone (1 month) does not significantly affect the cardiometabolic profile or the metabolome in TGM adolescents. Future studies will investigate the effect of 12 months of exogenous testosterone on the metabolomic profile in TGM adolescents.

INTERVENTIONS TO ADDRESS HEALTH DISPARITIES IN MANAGEMENT OF DIABETIC RETINOPATHY AMONG AFRICAN AMERICANS IN THE UNITED STATES (US)

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10.1136/jim-2021-WRMC.105

Purpose of Study Diabetic Retinopathy (DR) is a serious downstream effect of uncontrolled diabetes. Our objective is to assess the effectiveness of intervention strategies to improve the care of African Americans with diabetic retinopathy.

Methods Used A literature review was performed on PubMed, and Google Scholar databases using the key terms: race, diabetic retinopathy, intervention, management, and African American. Only prospective controlled studies of adults (>18 years of age) that primarily involved diabetic African Americans in the US were included in this review.

Summary of Results Of the 21 articles found, only 7 met our inclusion criteria (table 1). At baseline, the rate of dilated eye exams for patients with DR ranged from 19.2% to 65.1% in different studies. Although the majority of studies showed an increase in dilated eye exams after the intervention, the study with a multidimensional education and behavioral intervention showed the highest improvement (34.1% to 87.1%, $p < 0.001$). Possible explanations for lack of significant improvement in 2 of the studies include small sample size as well as exposure of both control and intervention groups to other health initiatives which could have improved outcome in both groups.

Conclusions Our literature review suggests that intensive multidimensional and tailored intervention strategies are effective in improving the rate of eye exams in the African-American population with diabetic retinopathy. Follow-up studies to evaluate the long-term effectiveness of different interventions are needed to explain why a gap exists even after intervention.

Abstract 105 Table 1 Studies of diabetic retinopathy management in African-Americans

| First Author Last Name, Year and Location | Total Number of Subjects and Mean Age (yrs) | Total Number and Percentage of Subjects in each group with Diabetic Retinopathy | Intervention | Outcome Measured | Factors Associated with Improved Outcome |
|---|--|---|--|--|--|
| Basch 1999, New York | N=280, mean age Intervention group=55.6, mean age Control=53.9 | All African American, Intervention group n= 137, Control Group (standard of care), n=143 | Individualized Education: Videotape, phone counseling | Dilated eye exam within 6 months | Dilated eye exam f/u in intervention group vs control: 54.7% vs. 27.3% ($p < 0.05$) |
| Zhang 2009, North Carolina | N=1289, age > 18 yrs old | All African American, Intervention group n=617, Control n=672 | Project *DIRECT 1: Community-wide eye care education focused on diet and physical activity in the intervention community | Survey sent to patients with DR in 1997 (baseline) and 2004 (after intervention) to follow-up on annual dilated eye exams and eye education in two communities | Dilated eye exam decreased among both groups: intervention group (85.8% to 72.8%); control group (81.6% to 66.1%) but increased among those without DR: intervention group (52.7% to 59.0%); control group (48.7% to 57.7%) |
| Weiss 2015, Will Eye Hospital in Philadelphia, PA | N= 206, mean age Intervention= 72.8, Control group= 72.8 | All African American, Intervention/*BADRP group n=103, Control/supportive therapy n=103 | *BADRP combines diabetes education, behavioral therapy and health belief model, problem solving skills and formulating an action plan. | Medical documentation of diabetic fundus exam within 6 months | Dilated exam in Intervention vs. Standard Supportive= 87.9% vs 34.1% ($p < 0.001$). |
| Davis 2010, South Carolina | N=165, mean age= 59.9 | 74% African American, Intervention group: n=85, Control group: n=80 | Diabetes TeleCare intervention: 13 sessions (3 individual and 10 video conferencing) | Frequency of eye exams in clinic after telemedicine visit | Intervention vs. Control eye exam baseline: 51.2% vs 46.3%. After intervention at 12 months: 81.2% vs. 38.8%, $p = 0.0001$ |
| Aleo 2015, Philadelphia, PA | N=83 African American with DR, mean age=54.7 | Intervention group (contract)=42, Control group=41 | The intervention group consisted of signing a contract for follow-up | follow up appointment adherence in participants with DR | Intervention vs. Control: 38.1% vs 43.9% ($P = 0.59$) |
| Anderson 2003, Detroit, MI | N=132, mean age= 55.75 | All African American after randomization, Intervention/personalized group: n=67, control group/standard: n=65 | Intensive personalized follow up plan with phone calls and education | Annual follow-up diabetic eye evaluation | Intervention vs. Control eye exam baseline: 24.2% vs 26.2%. After intervention, yearly eye visit increased 65.7% vs 35% ($P = 0.001$), odds ratio that return for DEE was due to personal follow up 5.62 (CI=2.13,14.86 $P = 0.0006$) |
| Walker 2008, Bronx, NY | N=598, mean age= 56.6 | African American:45%, Hispanic/Latino: 42.5%, Intervention/Phone calls): N=305, Control group (print)=293 | Tailored telephone intervention with education and risk communications. Up to 7 phone calls within 6 months was allotted | Documentation of a dilated fundus exam within 6 months | Intervention vs. Control: 33.8% vs 18.5% ($p < 0.0005$) |

DIRECT= Diabetes Interventions Reaching and Educating Communities Together BADRP= Behavioral Activation for Diabetic Retinopathy Prevention

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11-OXYGENATED ANDROGEN METABOLITE CONCENTRATIONS ARE AFFECTED BY PUBERTAL PROGRESSION AND OBESITY

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10.1136/jim-2021-WRMC.106

Purpose of Study The 11-oxygenated androgen metabolites are emerging as significant, bioactive compounds. These androgen compounds rise in early adrenarche and have unique expression patterns throughout the lifespan. The pattern of 11-oxyandrogen expression during normal puberty and the effects of obesity have not yet been reported.

Methods Used This is a secondary analysis of healthy youth of both sexes, any BMI, enrolled in 5 prior endocrine studies (N=203). A subset of participants had longitudinal puberty data (51 participants with 129 visits). Pubertal development was assessed by a pediatric endocrinologist using Tanner stage criteria and fasting serum samples collected. Three 11-oxygenated androgens, 11-hydroxyandrostenedione (11OHA4), 11-hydroxytestosterone (11OHT), and 11-ketotestosterone (11KT), were analyzed via liquid chromatography tandem mass spectroscopy (Lapcorp/Esoterix). Linear mixed effect models were used to assess for difference by sex and pubertal stage, controlling for the effect of body mass index (BMI).

Summary of Results In both cohorts, 11OHA4 and 11OHT increased in normal weight youth of both sexes between early (Tanner 2/3) and late (Tanner 5) puberty ($p < 0.05$). 11KT was non-significantly elevated as puberty progressed in normal weight youth in the cross-sectional cohort ($p = 0.06$). 11KT increased significantly in normal weight females between Tanner 2/3 and 4 in the longitudinal cohort ($p < 0.05$). 11KT differed between sexes ($p < 0.006$) with levels higher in normal weight males compared to normal weight females most notably at Tanner 2/3 ($p = 0.02$) and Tanner 5 ($p = 0.02$). 11KT differed between normal weight and obese youth ($p = 0.01$) with obese males having lower levels than normal weight males at Tanner 2/3 ($p < 0.005$) and Tanner 4 ($p = 0.02$). Trajectories of 11OHA4 expression throughout puberty differed between normal weight and obese youth of both sexes ($p = 0.05$).

Conclusions 11-oxyandrogens rise during pubertal development and may play a role in the phenotypic effects of puberty. 11KT expression differs between sexes, suggesting possible gonadal origin of this androgen that becomes evident during puberty. Obesity appears to influence the expression of 11-oxyandrogens.

Healthcare research III – machine

Concurrent session

11:05 AM

Friday, January 29, 2021

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DEVELOPMENT AND EVALUATION OF A VOLUMETRIC ASSESSMENT TOOL USING AN IOS-BASED APP FOR THREE-DIMENSIONAL CLINICAL MEASUREMENTS

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10.1136/jim-2021-WRMC.107

Purpose of Study Objective clinical measurement of volume enhances clinical and surgical decision making by enabling physicians to rely on quantitative data rather than visual judgment. While complex systems have been developed for this purpose, a simple and cost-effective method to obtain such data has not been validated. This study investigates the feasibility of using an inexpensive, portable 3D scanner to clinically assess volume.

Methods Used Balloons were filled to known volumes of fluid in 30cc increments between 300cc and 900cc, 100cc increments between 1000cc and 1500cc, and 250cc increments from 1500cc to 3000cc. The balloons were suspended and scanned with a Structure Sensor ST01 connected to an Apple iPad Mini. Two scans were taken at each volume. Resulting 3D scans were imported into Blender, a 3D creation suite, which calculated the volume of the balloons using the 3D scanner data. Calculated volumes were then compared to known volumes to evaluate the accuracy of the scanner.

Summary of Results The 3D scanner yielded an overall average absolute percent error of 2.94% with a standard deviation of 1.54% (table 1). Analysis of the data revealed that the scanner was less accurate at the extremes (300–450cc and 1400–3000cc) and tended to be least precise at the larger volumes (1400–3000cc). Absolute percent error was less than 5% in 84.85% of all individual scans.

Conclusions The Structure Sensor ST01 used with an iPad Mini and a 3D creation suite yields sufficient accuracy for clinical assessment of volume. Although accuracy was not constant at all volumes, the pattern of absolute percent error present in the data followed the same pattern as the ability of individuals to perceive changes in volume – that is, the just-noticeable change in volume is relative to the initial volume. Larger errors were observed in the scans from 300–450cc and

Abstract 107 Table 1 3D scanner yielded an overall average absolute percent error of 2.94% with a standard deviation of 1.54

| | Average Abs. % Error | Average Abs. Vol. Error (cc) |
|-----------|----------------------|------------------------------|
| Scan 1 | 2.33% | 25.28 |
| Scan 2 | 3.54% | 42.82 |
| Overall | 2.94% | 34.05 |
| Std. Dev. | 1.54% | 37.27 |

1400–3000cc. Observable patterns in the data from the 3D scanner suggest that this method of measuring volume yields measurements that are sufficiently accurate to be valuable for clinical use.

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DIAGNOSING MUSCULOSKELETAL DISEASES USING ARTIFICIAL INTELLIGENCE AND ENSEMBLE MACHINE LEARNING

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10.1136/jim-2021-WRMC.108

Purpose of Study From bone fractures to chronic joint diseases, one out of three people in the world are affected by a musculoskeletal (MSK) condition, impacting over 2 billion people globally. To diagnose and treat patients, physicians order X-rays and other medical imaging to evaluate patients' MSK conditions. Especially during emergencies and in underserved areas, there is a high volume of imaging that needs to be analyzed with speed and accuracy, but there is often limited physician availability. Detecting abnormalities in MSK radiology with high accuracy and precision is thus essential. In this research, artificial intelligence is applied to create a machine learning model to evaluate musculoskeletal abnormalities in radiology, aid physicians in analysis, and ultimately improve patient outcomes through accurate MSK disease detection.

Methods Used In this research, an ensemble machine learning model was designed and developed to help detect abnormalities in musculoskeletal radiographs. The ensemble machine learning model was applied to MURA, a musculoskeletal radiographic clinical patient dataset containing over 40,500 images from Stanford University. Data from 60% of the patients were used to train the machine learning model, and the remaining 40% of the patient data was used for testing performance.

Summary of Results In diagnosing the MSK diseases in patients, the machine learning model achieved 78% sensitivity and 80.2% specificity.

Conclusions Thus, based on the results, computer-aided diagnoses using artificial intelligence and ensemble machine learning can help detect abnormalities in MSK radiographs to aid patient outcomes. Furthermore, in areas where there are fewer radiologists present and limited access to healthcare, the machine learning model may be utilized as a cost-effective option to aid in the early detection and accurate diagnosis of MSK diseases in underserved populations.

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PAIN DETECTION AND DIAGNOSIS USING MACHINE LEARNING

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10.1136/jim-2021-WRMC.109

Purpose of Study According to the Centers for Disease Control and Prevention, more than 100 million Americans are affected by pain. Pain is multimodal and often complex to evaluate and diagnose. With early detection and diagnosis, patients can

be counseled, treated, and managed with more optimal outcomes and a higher pain control rate. Therefore, detecting, predicting, and diagnosing pain early and accurately is critical for patient outcome optimization as well as improving quality of life for patients.

Methods Used Expressive behaviors in facial emotion recognition and bodily movement detection from individual body parts have been found to aid in the detection of pain. In this research project, a machine learning model is developed using artificial intelligence with the above listed methodologies and clinical patient data to aid the detection and diagnosis of pain to increase its diagnostic accuracy.

The machine learning model was built using deep network algorithms to predict and diagnose pain in patients. Clinical data from patients with chronic pain and healthy participants was used to develop, train, and test the machine learning model. To train the model, 60% of the patient data was randomly selected, while the remaining 40% of the data was utilized for testing pain diagnosis capabilities of the model.

Summary of Results In evaluating pain levels in patients, the machine learning model was able to achieve an overall accuracy of 58% compared to previously published methods ranging from 31% - 53% in accuracy.

Conclusions Thus, machine learning algorithms can be used to help medical professionals globally for enhancing early detection and diagnostic accuracy of pain for optimizing quality of life in patient care.

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TELEMEDICINE SOLUTIONS TO IMPROVE HIV PRE-EXPOSURE PROPHYLAXIS ACCESS IN FREMONT COUNTY, WY

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10.1136/jim-2021-WRMC.110

Purpose of Study Fremont County, WY has a rural population of 39,803 with above average poverty rates. The county holds 9% of HIV cases (n=31) in Wyoming while holding 6% of the population. Sexually transmitted infection (STI) trends are above the Wyoming average and rising. The rural nature of the county makes access to HIV care and pre-exposure prophylaxis remarkably difficult. Limited access, high stigma, and low awareness creates a concerning public health environment for the future of HIV cases in the county. This paper examines the use of a public telemedicine service as a community-asset based approach to improve access to HIV pre-exposure prophylaxis.

Methods Used The investigation into HIV pre-exposure prophylaxis (PrEP) in Fremont County was guided by two factors: 1) interviews with local providers, patients, and community organizations and 2) literature review. A patient interview provided context to the local community and sought to investigate both community assets and deficits. An interview with a public health nurse and two local providers further focused on public health concerns and highlighted local assets. Review of Wyoming public health reports, community needs assessments, and relevant literature were conducted to understand the importance of PrEP, HIV trends, and efficacy of telemedicine.

Summary of Results A local provider cited a concern with the complete absence of PrEP care in the county and limited public education about STIs. Both interviews with public health

and local patients revealed substantial access to technology required for telemedicine. Technology access, established relationships between public health and the nearest PrEP providers, and an existing communicable disease treatment program creates an excellent opportunity to capitalize on community assets to address deficits in PrEP access. Wyoming public health reports further reinforced the need for access to PrEP as a method of combating HIV in the state. Literature review provided promising insights into implementation of a 'TelePrEP' program for Fremont County.

Conclusions Thoughtful implementation of a Fremont County TelePrEP program could significantly reduce the challenges to PrEP access while utilizing community assets already in place. If successful, there is great potential for expansion to a state-wide program.

111 EFFICACY OF A HIGH SCHOOL ECOSYSTEM PROGRAM ON UNDERREPRESENTED MINORITY STUDENT ATTAINMENT OF HEALTH PROFESSIONAL CAREERS

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10.1136/jim-2021-WRMC.111

Purpose of Study The purpose of this study is to explore the stories and career trajectory of high school students who participated in the U-DOC summer program at the University of Washington School of Medicine and regional sites from 1994–2012.

Literature concerning the effectiveness of pipeline programs' role in increasing diversity in medicine is becoming more scarce due to the closure of several medicine-related ecosystem programs in recent years. This may further exacerbate the already severe lack of diversity within health professions and it is important to explore the impact these programs have in addressing physician workforce diversity.

Methods Used During the tenure of the U-DOC program, there were 901 participants. We were able to track 244 and 91 went into health professions. 14 interviews were conducted with alumni after participants were identified via the snowball method. Of the 14 interviewed, 7 went into medicine or dentistry. A standardized set of questions was developed which elicited vivid accounts of the program as well as the interviewee's career paths after that summer. Dedoose was used to analyze emerging themes identified.

Summary of Results Interviewees noted the program's significance in their later career choices. Themes that emerged were support and being surrounded by a diverse and driven group of peers. Interviewees reported the support and encouragement of the program's faculty and their peers as helpful in pursuing advanced degrees. Some limitations in the program mentioned by the interviewees included difficult S.T.E.M. coursework in college and the need for longitudinal support after the program.

Conclusions Students from low-income, first-generation households, and those who identify as underrepresented in medicine need support in pursuing medicine and other healthcare fields. The social support from peers as well as program faculty can be fundamental in their pursuit of S.T.E.M. studies in college as well as their perseverance when faced with obstacles. Summer-long residential ecosystem programs, like U-DOC, are conducted at an impressionable time in adolescence. The guidance, encouragement, and structure offered to students who

are not typically encouraged to pursue S.T.E.M. fields can be life-changing, even if it leads to other professional careers outside of medicine.

112 EVALUATING ETHICAL CONCERNS WITH MACHINE LEARNING TO GUIDE ADVANCE CARE PLANNING

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10.1136/jim-2021-WRMC.112

Purpose of Study To generate ethical guidance for machine learning-guided advance care planning (ML-ACP), using a prediction of 3–12 month mortality as a proxy to identify patients who could benefit from ACP, we sought to (1) understand the attitudes of clinicians, patients, and designers impacted by the ML-ACP and (2) identify where ethical problems were emerging or likely to emerge with deployment of the ML-ACP. The ML-ACP screened patients at admission to an adult, inpatient general medicine ward.

Methods Used Our analytic framework relied on 5 premises: (1) multiple stakeholders are impacted by the ML-ACP and can be identified; (2) stakeholders have different explicit or implicit values/goals for the ML-ACP, that can be ascertained; (3) ML-ACP design involves making a series of decisions; (4) how a stakeholder makes these decisions, or would want these decisions made, reflects their underlying values/goals; (5) where stakeholder groups disagree about decisions are where ethical problems are most likely to emerge.

We used snowball sampling to identify stakeholders involved with or impacted by the ML-ACP and conducted 17 semi-structured interviews (computer scientists, primary care physicians, palliative care clinicians, oncologists and patients). Interviews were analyzed using modified grounded theory. All interviews were co-coded by two researchers and any areas of discordant coding were discussed to consensus through an iterative process.

Summary of Results Stakeholders' values/goals were in conflict on whether patients should be informed of their mortality predictions, who should receive the prediction (primary physician, palliative care, patient), and whether and how the working of the ML-ACP should be made transparent.

Conclusions ML-ACP has the potential to improve ACP delivery by expanding patients' access to needed palliative care services. However, our analysis suggests several areas where ethical concerns are likely to emerge and should be pre-emptively addressed prior to full ML-ACP deployment. Our analysis also suggests that pilot ethical analysis can be done and may be valuable to design teams considering ML solutions to other clinical problems.

113 HUMAN-CENTERED DESIGN IN RESPONSE TO A PANDEMIC: A HEALTH SYSTEM AND INNOVATION CENTER COLLABORATION

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10.1136/jim-2021-WRMC.113

Purpose of Study In the spring of 2020, the coronavirus pandemic brought new challenges to healthcare systems as the

rising demand for protective equipment led to product and resource inequalities around the globe. The inability to safeguard workers led to increased infection rates and deaths of healthcare professionals worldwide. The purpose of this study is to evaluate the response of an in-house innovation committee to meet the unforeseen needs faced by healthcare systems during an acute medical crisis.

Methods Used Housed directly within the University of Utah's health system (U Health), The Center for Medical Innovation (CMI) teamed up with the hospital's administration, BME, COVID task force, and occupational health to create an innovative think-tank to tackle the challenges brought in by the coronavirus pandemic, with the purpose of stratifying clinical needs based upon acuity, frequency, and urgency. While prioritizing equipment needs, CMI used human-centered design to analyze common industry practices, engineer comparable solutions from commercially available materials, test reimagined products against known gold-standards, and create open-source assembly guides that allowed others facing similar shortages to do the same.

Summary of Results The close-working relationship between CMI and U Health allowed for the rapid identification, innovation, and engineering of products that met the needs of healthcare workers during the months following the COVID pandemic. Many of these were directly adopted in clinical settings, including aerosol containment tents, powered air-purifying respirators, and self-testing stations. Additionally, CMI identified and engineered 20 additional readily producible, rapid-response products in anticipation of future needs, such as a bubble CPAP, containment boxes, and re-usable PPE. From these, dozens of open source, 'Improvised Personal Protective Equipment' manuals were shared with global partners to address the inequality of medical equipment in low-resource settings.

Conclusions The rapid development of easily-producible, low-cost solutions for acute clinical needs—especially those faced by the equipment shortages seen during a pandemic—is improved via the partnership between health systems and a center for medical innovation.

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CONTENT ANALYSIS OF FREQUENCY OF INFORMATION ABOUT DEVELOPMENTAL DYSPLASIA OF THE HIP ON TWITTER

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10.1136/jim-2021-WRMC.114

Purpose of Study Developmental dysplasia of the hip (DDH) is a spectrum of pediatric hip conditions. Early detection and screening of DDH is critical in reducing complications; thus, advocacy and awareness are paramount. Social media, particularly Twitter, connects users based on their content engagement, allowing a global audience to interact with one another. Twitter's limitations on word count facilitate precise, condensed communication. Social media platforms were chosen in the study because of their strength to quickly disseminate information to a wide range of individuals; it is crucial that the published information is not misinforming the public. The objective of this study was to assess the frequency and content of information being published on Twitter pertaining to DDH.

Methods Used An *a priori* coding guide using search terms was created to establish a framework to extract information regarding DDH on Twitter. Data was extracted over one-week periods in June and July of 2019 and 2020. An Excel-based coding guide was developed to organize and analyze the extracted data.

Summary of Results A total of 146 tweets were extracted for analysis; 46 in 2019 and 101 in 2020. The most frequently-used search terms were hip dysplasia, developmental dysplasia of the hip, and dislocated hip. The most frequent authors were healthcare professionals and healthcare organizations in 2019 and patients in 2020. Prevention, treatment, and general discussions were top categories in 2019, compared to education, awareness and general discussions in 2020.

Conclusions Our data indicates that over the span of a year, user engagement with DDH content on Twitter increased by 58.4%. We found similar patterns regarding the types of authors and content type in 2019 and 2020. Our analysis identified gaps in the use of Twitter that could be implemented by users to optimize messages, such as connecting directly and conversing with users through replies. Findings also indicate the importance of multi-author engagement to increase the breadth of distribution of information. Through analysis on how users utilize Twitter to inform the public about DDH, we aim to create tools that would promote advocacy and increase early detection and screening.

Neonatology pulmonary

Concurrent session

11:05 AM

Friday, January 29, 2021

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ACETAMINOPHEN-INDUCED NEONATAL LUNG INJURY AND DEVELOPMENTALLY REGULATED CYP2E1 EXPRESSION

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10.1136/jim-2021-WRMC.115

Purpose of Study Acetaminophen (APAP) during the perinatal period are rapidly increasing. Exposures occur with maternal ingestion during gestation, and postnatally for analgesia and treatment of the PDA. Study of the APAP-induced liver injury demonstrated that toxic exposures cause cellular injury due the CYP2E1 mediated production of the toxic metabolite NAPQI. In the mature lung, pulmonary CYP2E1 expression results in APAP-induced lung injury with toxic ingestions. However, whether the developing lung expresses CYP2E1, or is susceptible to the toxic effect of APAP exposure is unknown.

Methods Used Pulmonary tissue was collected from the canalicular (e15), saccular (e18, P0, P3) and alveolar (p7 and p21) and pulmonary Cyp2e1 expression was determined using RNAscope and qPCR. Neonatal (P7; n=4–6 per time point) male mice were exposed to APAP (5 and 24 hrs; 280 mg/kg, IP). APAP-induced pro-inflammatory cytokine expression was

assessed using qPCR, while liver and lung injury was assessed using previously validated morphometric measures.

Summary of Results Pulmonary *Cyp2e1* expression peaked in the saccular stage of development (e18) and was present in the early alveolar stage lung. RNAscope revealed very little *Cyp2e1* expression in the canalicular stage lung, with expression becoming more diffuse in the developing pulmonary mesenchyme by e18. APAP induced significantly increased pulmonary expression of *Cxcl1*, *Cxcl2*, *Cxcl10*, *Il1a* and *Il1b* at both 5 and 24 hours of exposure ($P < .05$). No hepatic injury was noted histologically. In contrast, at 24 hours of exposure, the lung demonstrated significant increase in objective measures of respiratory and terminal bronchiolar injury, peripheral lung macrophage load and peripheral lung emphysema.

Conclusions *Cyp2e1*, the enzyme responsible for converting APAP into the toxic metabolite NAPQI is expressed in the developing lung. Consistent with this observation, following toxic APAP exposures, the developing lung demonstrates injury in both the proximal and distal lung. These findings have implications for the use of APAP in the pediatric population. Further work is necessary to determine whether lung injury occurs with lower dose exposures or with repetitive exposures, and the implications of early life APAP exposure on pulmonary function later in life.

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IMPAIRED INFANT LUNG GROWTH AND FUNCTION IN MICE WITH GENETIC DELETION OF ENDOTHELIAL CELL-SPECIFIC VITAMIN D RECEPTOR EXPRESSION

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10.1136/jim-2021-WRMC.116

Purpose of Study To determine whether endothelial cell-specific genetic deletion of the VDR gene in mice (VDR-ECKO) disrupts normal lung growth during infancy, and whether these VDR knockout mice demonstrate impaired lung function during infancy.

Methods Used We generated a mouse model with endothelial cell-specific VDR deletion using Cre-Lox recombination. Tie2-Cre transgene mice expressing endothelial cell-specific Cre recombinase (Tie2Cre) were bred with mice expressing LoxP sites bordering exon 3 in the VDR gene. At two weeks of age, we measured distal lung structure by morphometric analysis (radial alveolar counts (RAC); lung mechanics by Flexivent (total respiratory system resistance and compliance; and right ventricular hypertrophy (RVH) by standard methods.

Summary of Results At 2 weeks of age, body weight was not different in VDR-ECKO mice when compared with controls. Histologically, lungs from VDR-ECKO mice had impaired alveolar structure in comparison with controls as assessed by decreased RAC ($P < 0.05$). In comparison with controls, lung mechanics were abnormal in VDR-ECKO mice, which included increased total respiratory resistance ($p < 0.01$) and decreased respiratory lung compliance ($p < 0.01$). RVH was not different between study groups.

Conclusions We found that endothelial cell-specific genetic disruption of VDR impaired lung structure and mechanics in infant mice. We speculate that endothelial VDR plays an important role in endothelial cell function, which contributes to normal lung growth and development.

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THE EFFECT OF SEROTONIN DEPLETION ON HYPOXIA INDUCED BRONCHOPULMONARY DYSPLASIA AND PULMONARY HYPERTENSION IN MICE

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10.1136/jim-2021-WRMC.117

Purpose of Study Pulmonary hypertension (PH) associated with bronchopulmonary dysplasia (BPD) leads to worse clinical outcomes in former preterm neonates. Serotonin (5-hydroxytryptamine, 5-HT) is a potent pulmonary vasoconstrictor, smooth muscle mitogen, and is increased in the lungs of infants who died with severe BPD. Tryptophan hydroxylase 1 (TPH1), the rate limiting enzyme in 5-HT synthesis, is increased in patients and animals with experimental PH. Serotonin signaling blockade decreases pulmonary vascular resistance and prevents pulmonary vascular remodeling in preclinical neonatal PH models. We hypothesized neonatal TPH1 knock-out (KO) mice would be protected from hypoxia induced BPD and PH.

Methods Used Neonatal wild-type (WT) and TPH1 KO offspring were placed in hypoxia or remained in normoxia at Denver altitude for 2 weeks. Weights were recorded at 2 weeks. Plasma 5-HT levels were measured by ELISA. To assess alveolar development, inflation fixed lungs were analyzed for surface area (SA) and mean linear intercept (MLI). To identify total number of small vessels ($< 30 \mu\text{m}$), lung sections were immunostained with VWF. PH was assessed by Fulton's index and right ventricular systolic pressures (RVSPs). Data were analyzed by Prism via unpaired t-test or 2-way ANOVA via Bonferroni post-hoc analysis. Significance level $p < 0.05$.

Summary of Results TPH1 KO mice weighed less than WT mice in normoxia and hypoxia. Serotonin levels were significantly decreased in TPH1 KO mice. However, measurable levels of 5-HT remained in TPH1 KO mice. Alveolar development, vascular development, and RVSPs were similar in TPH1 KO and control mice. TPH1 KO mice were not protected from hypoxia induced alveolar simplification or hypoxia induced pulmonary vascular simplification. TPH1 KO mice displayed attenuated hypoxia induced pulmonary vasoconstriction, shown by reduction in RVSPs ($32 \pm 0.66 - 29 \pm 0.55$, $p < 0.006$).

Conclusions We speculate the lack of protection against hypoxia induced lung injury observed in TPH1 KO mice may be the result of decreased growth in KO animals and/or be a consequence of 5-HT levels.

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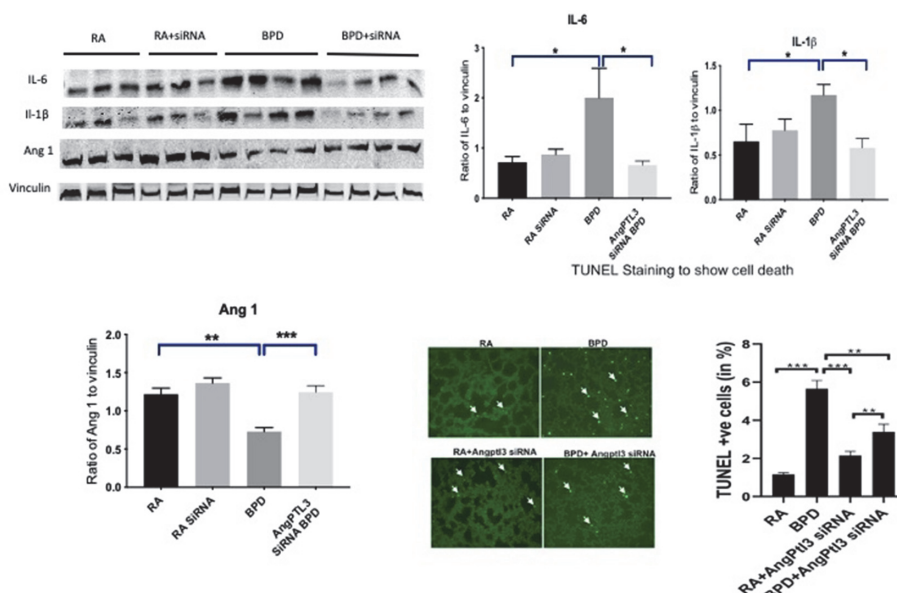
ANGIOPHOTIN LIKE PROTEIN-3 EXPRESSION IN NEONATAL LUNG AND ITS ROLE IN EXPERIMENTAL BPD

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10.1136/jim-2021-WRMC.118

Purpose of Study To demonstrate the presence of ANGPTL3 in human & mouse lung tissue & to evaluate its potential role in a mouse model of experimental BPD

Methods Used ANGPTL3 expression was demonstrated in mice lung tissue, human lung tissue and human fetal endothelial cells using western blot. Newborn C57BL/6 mice were



Abstract 118 Figure 1 Administration of ANGPTL3 (si)RNA decreased IL's, increased ANG1 & decreased cell death

exposed to 60% O₂ for the first 4 postnatal(P) days of life and recovered in room air (RA) for the next 10 days. ANGPTL3 silencing(si) RNA was administered in RA and BPD groups to evaluate its effect on pulmonary phenotype.

Summary of Results Expression of ANGPTL3 was increased at P4 & BPD time points in mouse model of BPD when compared to RA controls. ANGPTL3 levels also increased in human lung tissue & human fetal lung endothelial cells, when compared to their controls. Administration of ANGPTL3 siRNA to the mouse model of BPD was associated with decreased BAL fluid cell counts, improved lung phenotype-decreased chord length, septal thickness & improved radial alveolar counts (all $p < 0.0001$). It was also associated with a decrease in inflammatory markers, increase in Ang1 & decrease in cell death (figure 1)

Conclusions ANGPTL3 is expressed in lungs and is increased in human and experimental BPD. Decreased ANGPTL3 was associated with decreased inflammation & cell death, & improved pulmonary phenotype in the experimental model of BPD, suggesting a potential role in the pathogenesis of human BPD.

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PROSTACYCLIN ANALOG TREPROSTINIL ENHANCES NEONATAL RAT LUNG ENDOTHELIAL CELL GROWTH AND ANGIOGENESIS *IN VITRO*

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10.1136/jim-2021-WRMC.119

Purpose of Study Bronchopulmonary dysplasia (BPD) is the chronic lung disease that often follows preterm birth. Characterized by abnormal lung structure due to impaired alveolar and vascular growth, BPD is strongly associated with mechanisms such as postnatal hyperoxia and the risk for pulmonary hypertension (PH). Previously, we found that treprostnil (TRE), a synthetic prostacyclin analog, preserved lung structure and function, improved vascular growth, and prevented right ventricular hypertrophy in a hyperoxia-induced neonatal

rat model of BPD. To determine whether the effect of TRE on neonatal lung development is partly due to the stimulation of angiogenesis, we studied the effect of TRE on rat lung endothelial cell (LEC) growth and tube formation *in vitro*.

Methods Used LECs were isolated from 2-week old rats and grown in 10% FBS. To assess cell proliferation, LECs were plated in 2.5% FBS (5000 cells/well), grown in normoxia with daily media changes, and counted after 3 days. To assess angiogenesis, LECs were plated in 1% FBS (10,000 cells/well) on collagen and fixed in 4% PFA after 18–24 hrs in normoxia. Cells were imaged at 10x and tube formation was assessed by counting branch points per high powered field. For both assays, the following treatments were studied: untreated FBS (control), TRE (1uM), Axitinib (AX, selective VEGF receptor inhibitor; 10nM), and TRE+AX.

Summary of Results TRE increased LEC growth and tube formation by 109% and 51%, respectively ($p < 0.01$ and $p < 0.05$). AX alone did not decrease LEC growth, and when TRE was administered with AX, the effect of TRE was not attenuated. However, AX alone decreased tube formation by 38% ($p < 0.01$) but TRE administration with AX restored tube formation to control values.

Conclusions TRE enhances LEC growth and angiogenesis *in vitro*, supporting our previous findings that TRE improves lung alveolar and vascular growth *in vivo*. Further, we found that VEGF receptor blockade reduces tube formation but not cell growth, but this effect can be reversed by TRE. We speculate that these findings suggest interactions between the VEGF and prostacyclin pathways that can be targeted to develop novel therapies to prevent BPD and BPD-associated PH.

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IUGR REDUCES PHOSPHOLIPID CONTAINING DHA IN THE DEVELOPING RAT LUNG

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10.1136/jim-2021-WRMC.120

Purpose of Study Intrauterine growth restriction (IUGR) reduces neonatal circulating docosahexaenoic acid (DHA). Human preterm neonates with reduced circulating DHA have an increased incidence bronchopulmonary dysplasia (BPD). BPD is characterized by impaired development of the lung periphery, a process driven by cell-to-cell communications and the epithelial-mesenchymal transition. The precise role of DHA in the developing lung, and thus its contribution to BPD, is not well understood. An unexplored and potential role of DHA in promoting lung development is via its contribution to cell-to-cell communication and membrane fluidity, something known to be enhanced by DHA incorporation into phospholipids (PL). To date however, the location of DHA within lipid fractions of the developing lung is unknown, as is the effect of IUGR on this DHA partitioning.

We hypothesize that DHA is highly represented within the PL fraction of the lung, and that IUGR reduces PL DHA. We further hypothesize that maternal DHA supplementation restores PL DHA in IUGR rats.

Methods Used IUGR was induced by bilateral uterine artery ligation, control dams received anesthesia only. Maternal rats were randomized regular diet or diets supplemented with 0.1% DHA. At postnatal day 12 (d12) (toward the end of alveolar transition in the rat), rat pups were euthanized and lung tissue collected. Lung DHA content in all lipid fractions was measured using GC/MS, analysis was performed using MetaboAnalyst.

Summary of Results IUGR rat pups weighed significantly less than control at birth, and continued to weigh less than control at d12. Maternal DHA did not affect rat pup weight. The majority of lung DHA was confined to the PL fraction and the triglyceride fraction. IUGR decreased DHA content in the lung PL fraction by 50%*, without significantly altering DHA content in TG fractions. Maternal DHA normalized the PL DHA content in IUGR rats, while reducing DHA content in the TG fraction by 20%*. * $P < 0.05$.

Conclusions We conclude that DHA is highly represented in the PL fraction of the developing lung, and that maternal DHA supplementation can restore IUGR-induced reductions in PL DHA. The implications of reduced PL DHA are less membrane fluidity and impaired cell-to-cell signaling, thus compromising lung development.

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BLOOD TRANSFUSION IN PRETERM INFANTS AND THE SUBSEQUENT DEVELOPMENT OF BRONCHOPULMONARY DYSPLASIA

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10.1136/jim-2021-WRMC.121

Purpose of Study Preterm infants are frequently transfused with red blood cells (RBC) in the NICU. Previous studies in neonates have found a need to escalate mean airway pressure or FiO₂ in the hours immediately following RBC transfusion suggesting that there may be negative effects on lung function leading to bronchopulmonary dysplasia (BPD). The purpose of this study was to investigate the relationship between RBC

transfusions and the subsequent development of BPD among preterm infants born at <32 weeks gestational age.

Methods Used This study utilizes a retrospective cohort design to evaluate preterm infants born <32 weeks between May 2007 to August 2020. BPD was defined as supplemental oxygen dependency at 36 weeks postmenstrual age. Bivariable and multivariable regression were used to evaluate the association between RBC transfusion and the subsequent development of BPD.

Summary of Results 622 infants were evaluated. Three hundred ten (50%) infants received a total of 1397 RBC transfusion exposures. 50% received their first and/or only RBC transfusion after 72 hours of life. Bivariable regression revealed a significant association between RBC transfusion and the successive development of BPD (OR, 13.2 [95%CI, 7.7–22.7], $P < 0.0001$). After adjusting for maternal age, placental transfusion, gestational age, birth weight, gender, surfactant administration, 5-minute APGAR score, and sepsis, receipt of RBC transfusion was associated with a 4.5-fold increased likelihood to later develop BPD (adjusted-OR, 4.5 [95%CI, 2.3–8.8], $P < 0.0001$). This relationship was also retained in sub-cohort analysis of extremely preterm infants born <28 weeks (adjusted-OR, 2.6 [95%CI, 1.0–6.5], $P = 0.046$).

Conclusions Red blood cell transfusion was an independent predictor of the subsequent development of bronchopulmonary dysplasia in preterm infants after adjusting for prematurity and severity of illness at birth. Prospective studies employing therapies to reduce the need for blood transfusion, such as erythropoietin administration or ensuring placental transfusion at birth, are needed to confirm this association.

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ACTIVE VITAMIN D IS SAFE FOR POSTNATAL SUPPLEMENTATION IN NEWBORN RATS

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10.1136/jim-2021-WRMC.122

Purpose of Study Maternal vitamin D deficiency (VDD) is associated with perinatal pulmonary morbidities. We have demonstrated that offspring of rodent VDD dams have sustained abnormalities of distal lung structure, increased airway hyper-reactivity and abnormal lung mechanics. Active vitamin D, 1,25-OHD, treatment preserves lung structure and prevents pulmonary hypertension (PH) in an experimental model of bronchopulmonary dysplasia (BPD). However, due to potential systemic side effects of 1,25-OHD the therapeutic use has been limited. Our goal was to determine the safety of postnatal 1,25-OHD supplementation on lung development in infant rats.

Methods Used Newborn control (CTL) rats received daily intra-peritoneal (IP) injections of either 1,25-OHD (1 ng/g) or saline. At two weeks, serum calcium, phosphate (phos) and 25-OHD levels were measured. Rat lung structure was assessed by radial alveolar counts (RAC), mean linear intercept (MLI), and pulmonary vessel density (PVD), and right ventricular hypertrophy (RVH) was determined by Fulton's Index. Lung function was measured (total respiratory system compliance and resistance) under baseline conditions and after

administration of methacholine (a bronchoconstrictor; 0–25 mg/ml) and albuterol (a bronchodilator; 0.83 mg/ml) to determine airway reactivity.

Summary of Results In comparison with CTL rats, daily 1,25-OHD treatment did not affect body weight, serum 25-OHD, calcium or phosphorus. Additionally, infant rats that were treated with postnatal 1,25-OHD did not have any differences in lung structure regarding MLI, RAC, and PVD, or the presence of RVH as compared to CTL. As compared to CTL, rats who received 1,25-OHD had no differences in total respiratory resistance or compliance, nor differences in reactivity to methacholine and albuterol treatment.

Conclusions Daily 1,25-OHD treatment does not alter body weight, calcium homeostasis, or 25-OHD levels. In addition, 1,25-OHD treatment neither alters distal lung structure or function, nor causes RVH. We speculate that postnatal treatment with biologically-active VD is potentially safe as a short term strategy but requires further study to determine efficacy for BPD prevention.

WAFMR and WSPR plenary award session and presentations

1:10 PM

Friday, January 29, 2021

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SMOOTH MUSCLE CELL PIEZO1 IN SMALL BOWEL CONTRACTILITY AND GROWTH

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10.1136/jim-2021-WRMC.123

Purpose of Study Piezo1 is a recently described mechanosensitive Ca^{2+} channel expressed in smooth muscle cells (SMCs) within the small bowel muscularis (SBM) yet its role in stretch-induced changes remains unknown. In vitro and in vivo methods were used to determine whether Piezo1 expressed in SMCs of the SBM is necessary for mediating acute and chronic stretch-induced intestinal contractility and growth of small bowel.

Methods Used Using the Piezo1/Myh11-ERT2/CreLoxP system, we generated a mouse model with a tamoxifen (Tam) inducible-Piezo1 knockout (Piezo1^{ΔSMC}) in SMCs. In vitro, SBM was isolated and developed on thermoresponsive hydrogel to acutely induce stretch when cooled to 33°C. Confocal microscopy was used to record contractility/ Ca^{2+} flux using gCaMP-6f indicator. In vivo, mice were given Tam and underwent distal SBO surgery to model chronic stretch.

Summary of Results In vitro results show that acute stretch of Piezo1^{ΔSMC} cells displays decreased frequency and a disorganized pattern of contractility/ Ca^{2+} flux compared to an increase in frequency in control (Piezo1^{WT}) cells. When treated with Piezo1 shRNA lentivirus, Piezo1^{WT} cells had a cessation of contractility/ Ca^{2+} flux with and without stretch. Similar results were obtained using human SBM. In vivo results show that Piezo1^{ΔSMC} mice had longer villi and crypts, and increased

Olfm4+ stem cells compared to Piezo1^{WT} mice. The chronic stretch of Piezo1^{ΔSMC} leads to an altered response to obstruction with significant attenuation in crypt and villi elongation and fewer Olfm4+ cells. Both in vitro and in vivo models of Piezo1^{ΔSMC} led to downstream transcriptional changes expressed in SBM.

Conclusions Our data suggest that Piezo1 in the SMCs of the SBM of humans and mice is essential for the maintenance of regular, rhythmic SMC contractility. In vivo, Piezo1 in SMCs partly mediate epithelial, crypt and stem cell expansion at homeostasis and chronic stretch. This data improves our understanding of how mechanosensitive channels mediate these changes and may have implications for future therapies for patients with gastrointestinal pathologies.

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LIPID EMULSION WITH FISH OIL AND EXTREMELY PREMATURE INFANTS: CLINICAL OUTCOMES

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10.1136/jim-2021-WRMC.124

Purpose of Study 100% soybean oil (SO100) emulsions are associated with low docosahexaenoic acid (DHA) concentrations in preterm infants. DHA is important for growth and neurodevelopment and may protect against parenteral nutrition associated cholestasis (PNAC). This study aims to compare DHA and clinical outcomes in premature infants who received SO100 or a lipid emulsion with DHA (15% fish oil, FO15).

Methods Used Inclusion criteria for this observational study: 1) born between 2014–2019, 2) birth weight <1 kg, 3) received SO100 or FO15 >7 days, and 4) survival to hospital discharge. Gas chromatography/mass spectrometry was used to measure fatty acids in the red blood cell membrane (RBC).

Summary of Results The mean (±SD) gestational age was 26 ±2 and 27 ±3 weeks for FO15 (n=43) and SO100 (n=43), respectively (p=0.2). Despite a greater RBC DHA% in FO15 (n=12) vs. SO100 (n=19) at study weeks 1–4 (p>0.05 for all), DHA decreased over time in both groups (-0.25%/week and -0.18%/week in FO15 and SO100, respectively, p<0.03 for both) with no difference in the rate of change between the two groups (p=0.7). When compared to SO100, FO15 reached full enteral feeds sooner (28 ±17 vs. 36 ±17 days, p=0.02). When compared to SO100, maximum conjugated bilirubin was lower in FO15 (1.3 ±3.0 vs. 1.9 ±3.3 mg/dL, p=0.001), and FO15 was less likely to develop PNAC (14% vs. 37%, p=0.03). The mean z-score change for weight was smaller in FO15 vs. SO100 (-0.3 ±1 vs. -0.8 ±1, p=0.02). After controlling for days to reach full enteral feeds, SO100 was associated with a non-significant increased risk for PNAC (OR 3.1, 95% CI 0.96–10.1, p=0.06), and growth trajectories were similar regardless of lipid type (p=0.9). The incidence of chronic lung disease, retinopathy of prematurity, late onset sepsis, and necrotizing enterocolitis was similar when the two groups were compared (p>0.6 for all).

Conclusions In this study, when compared to SO100, extremely premature infants who received FO15 had greater concentrations of DHA, but DHA still declined over time. Despite improved DHA status, infants who received FO15 had similar clinical outcomes when compared to infants who received SO100. Research is warranted to determine the optimal lipid emulsion for premature infants.

125 INVESTIGATING FETAL BODY COMPOSITION USING MAGNETIC RESONANCE IMAGING

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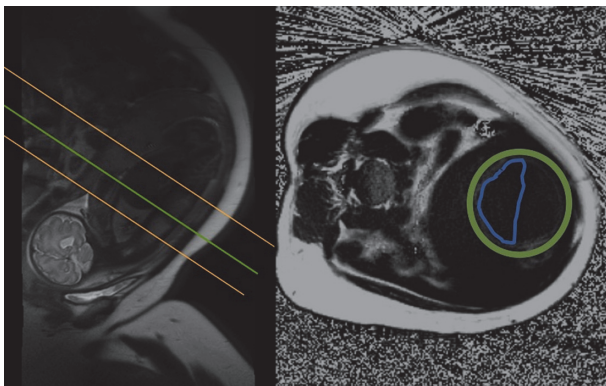
10.1136/jim-2021-WRMC.125

Purpose of Study Skinfold thickness and nuchal subcutaneous fat (nSAT) in adolescents has been associated with metabolic syndrome. In a retrospective study, we hypothesized fetal nSAT would correlate with birth weight z-score and pre-pregnancy body mass index (BMI). Information from the study was used to develop a pilot study that aims to create free-breathing MRI (FB MRI) sequences for fetal body composition analysis.

Methods Used We retrospectively analyzed fetal MRI in the second and third trimesters. Fetal nSAT (cm³) was measured from the tentorium attachment to vertebra T2. Inclusion criteria for the prospective study included healthy pregnant women. Total SAT, nSAT, and hepatic fat were measured by volume and proton density fat fraction (PDFF) maps.

Summary of Results We analyzed nSAT in 17 MRI scans. Gestational age and pre-pregnancy BMI did not correlate with nSAT, but nSAT had a strong predictive value for birth weight and length z-scores (slope=0.5 and slope=0.8, respectively, p<0.01 for both). Infants with intrauterine growth restriction (IUGR) and born small for gestational age (SGA) had a significantly lower nSAT than non-IUGR and non-SGA fetuses (p=0.001 and p=0.02, respectively). In our prospective study, we completed 2 MRIs (figure 1).

Conclusions This study demonstrates fetal nSAT can be measured using clinical MRI sequences and is a predictor of birth weight and length. Our on-going prospective study using FB MRI for fat analysis may provide insight into fetal origins of metabolic syndrome.



Abstract 125 Figure 1 32 week fetus FB MRI. A. Anatomical MR images. Green line marks the scan plane for B. B. PDFF maps. Green marks subcutaneous fat ring. Blue indicates the liver. Black indicates 0% and white indicates 100% PDFF

Adolescent medicine and behavior development III

Concurrent session

2:20 PM

Friday, January 29, 2021

126 USING MYHEARTSMAP TO MEASURE THE ASSOCIATION BETWEEN PSYCHOSOCIAL FACTORS AND PERSISTENT POST-CONCUSSIVE SYMPTOMS IN CHILDREN

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10.1136/jim-2021-WRMC.126

Purpose of Study Following mTBI, roughly 30% of children will experience persistent post-concussive symptoms (PPCS). This study will describe the association between psychosocial concerns and PPCS, using the Health and Behavior Inventory (HBI) and Post-Concussion Symptom Interview (PCS-I) scores.

Methods Used Children aged 8 to 17 years seeking care for mTBI or for orthopedic injuries (OI) as controls, were recruited in the emergency department as part of a larger prospective cohort study. We have created three linear regression models to examine the association between severity of psychosocial issues by MyHEARTSMAP domain (Psychiatry, Social, and Function) and PPCS.

Summary of Results We approached 153 participants and enrolled 122 (79.7%) to this study; 72 with mTBI and 50 with OI. Table 1 summarizes the adjusted coefficients among predictor variables on each measure of PPCS. Once adjusted for covariables, significant positive associations were found between scores on the Psychiatry domain and HBI Cognitive subscale, and Function domain with both HBI Somatic and PCS-I.

Conclusions Across all measures of PPCS, elevated scores in 2 of the 3 MyHEARTSMAP domains had a significant influence

Abstract 126 Table 1 Regression coefficients between time-correlated MyHEARTSMAP scores and PPCS measures

| | Adjusted Coefficient | | |
|----------------------------|----------------------|-------------|--------|
| | HBI Cognitive | HBI Somatic | PCS-I |
| Injury Group | 1.63 | 1.46* | 1.21** |
| Gender | 0.33 | 1.18 | 0.71 |
| Income | -1.24 | -0.48 | -0.32 |
| Age | -0.22 | -0.09 | -0.10 |
| Pain Unpleasantness Rating | 0.89 | 0.56 | 0.70** |
| Psychiatry | 1.02* | -0.04 | 0.32 |
| Function | 1.55 | 1.61** | 1.01** |
| Social | -0.05 | -0.25 | 0.04 |

* p<0.01

on count and severity of post-concussive symptoms. This suggests that multiple facets of psychosocial well-being have clinical utility in their association with functional outcome following concussion.

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QUALITY ASSESSMENT OF YOUTUBE AS AN INFORMATION SOURCE FOR PUBLIC EDUCATION RELATED TO NATIONAL STANDARDS FOR CONCUSSION ASSESSMENT IN ATHLETIC YOUTHS

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10.1136/jim-2021-WRMC.127

Purpose of Study National standards on the recommendations for the diagnosis of concussion have resulted in the standardization of clinical assessments and outcomes following injury. Purpose: to assess quality of public information on YouTube against national standards for concussion management in youth.

Methods Used We used the YouTube search feature to select videos for relevance by using the terms concussion, head trauma, and sports head injury. Data were collected using a standardized questionnaire by 4 reviewers assessing information from YouTube against the protocols for assessment from the Canadian National Concussion Management Guideline (2017). Top viewed videos were rated for: voice, creation by health care, patient or third party. The DISCERN criteria for video assessment of consumer health information were used for evaluation (1 low quality through 5 high quality). T tests compared accuracy of information based on videos created by health professionals versus non health professionals. Agreement between assessors was determined by Pearson correlation coefficient (r).

Summary of Results 275 videos were identified published since 2017 of which 80 were related to concussion assessment. Of these 80, 25 were created by health professionals and the remainder were published by non-medically trained persons. Mean length was 10.25 minutes (range 1.5 to 15 min). The mean DISCERN score was 2.5 (range 1 to 4.5). 54% contained mis information, varying from guideline recommendations regarding how assessment for concussion is carried out and when to seek further medical attention. There was good correlation between reviewers answers which was ($r > 0.8$).

Conclusions Although YouTube is a population choice for the public when seeking information about medical conditions, the information regarding concussion assessment was deemed of poor quality and varied from recommendations by national guidelines. Importantly, the majority of videos were not created by medical health professionals and those that were had statically fewer views than those created by the lay public. Patients who use YouTube for health information regarding concussion may be misled as to the current recommendations regarding assessment and treatment.

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DEVELOPING TOOLS TO IMPROVE PARENT HEALTH LITERACY IN NEPHROTIC SYNDROME

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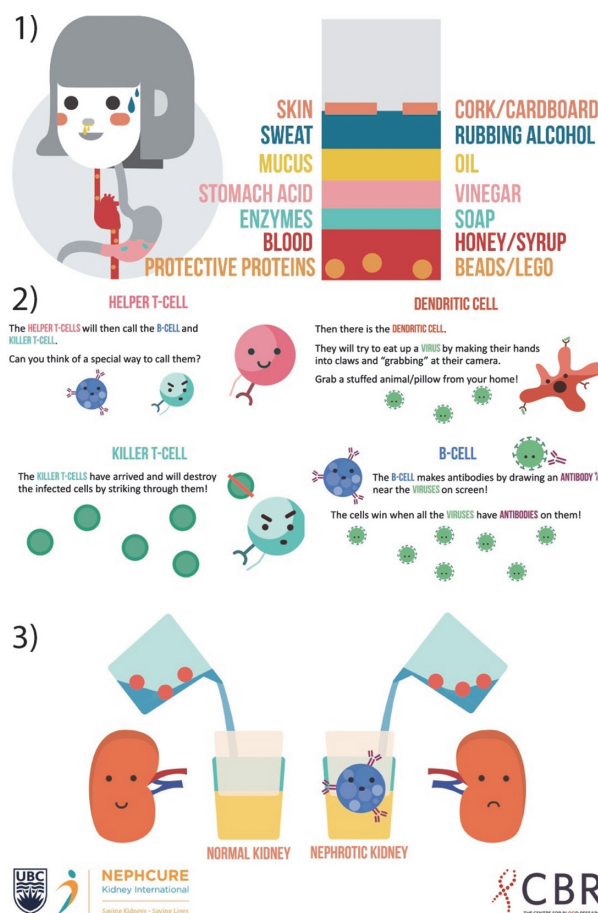
10.1136/jim-2021-WRMC.128

Purpose of Study With prior research demonstrating that parent health literacy impacts pediatric patient nephrotic syndrome health outcomes, the project aimed to develop online lesson-plans that support parent health literacy by teaching immunology topics and condition-specific topics.

Methods Used Lesson-plans were developed through research into effective online facilitation techniques and important aspects of nephrotic syndrome from a family and patient care perspective. The selected activities were then developed into lesson-plans, integrating parent and child engagement in each activity. All lessons were run over Zoom, allowing for continued engagement in a socially and geographically distanced format.

Summary of Results Three lesson-plans were developed as hands-on activities that utilized accessible materials families could find in their kitchen (figure 1). These lessons were facilitated through three sessions to 8 families who were surveyed on their knowledge confidence pre- and post-lesson.

Conclusions Parent feedback, while preliminary, suggested an increase in parental confidence in the discussed immunology and nephrotic syndrome topics. The creation of the lessons was successful, with three accessible online-facilitation based



Abstract 128 Figure 1 Lesson Plan Highlights
 1) Innate Immune System Layered-Liquid Tower
 2) Active Immune System Annotation Game
 3) Coffee Filter Nephrotic Syndrome Demonstration

lesson-plans created to address three aspects of the condition. Research into the impact of lesson-plans on specific health literacy metrics is ongoing.

129 RACIAL DISPARITIES IN PAIN MANAGEMENT OF CHILDREN IN THE EMERGENCY DEPARTMENT (ED)

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10.1136/jim-2021-WRMC.129

Purpose of Study Inequities in management of a variety of illnesses has been described, but data on disparities in pain management in children is lacking. The objective of this study is to assess racial and ethnic disparities in pain management among pediatric patients seen in emergency departments (ED).

Methods Used A literature review was conducted through Google Scholar and PubMed. Keywords included: racial disparities, bias, pain management, pediatric population, and health inequity. Only pediatric studies that were

published in the U.S. within the last 10 years and focused on racial disparities in pain management in ED settings were included.

Summary of Results Of 21 studies, 7 satisfied our inclusion criteria (table 1). The sample size ranged from 818 to 0.94 million pediatric ED patients. Minority children were more likely to receive analgesics (any pain medication) for acute pain management, but compared to whites, minority children were less likely to receive opioids for moderate to severe pain. The retrospective nature of the studies poses some limitations, such as the of patient refusal to take analgesics, lack of documentation of pre-treatment prior to ED visit or the misclassification of patient's race/ethnicity.

Conclusions Our review demonstrates possible racial and ethnic disparities in pain management in the ED setting. Although confounding variables and outcomes were not taken into account in some of the studies, all studies consistently showed that minority children were less likely to receive opioids for management of moderate to severe pain. Further investigation is necessary to better understand differential treatment in the emergency departments, and to create a standardized plans to eliminate any disparities.

Abstract 129 Table 1 Management of pain based on ethnicity

| First author, Publication Year, and Location | Type of Study | Total Number and Definition of Subjects | Definition of Outcome | Comparison of Outcome Based on Management of Different Ethnicities/Groups |
|--|---|---|--|--|
| Goyal et al., 2020; National Database, United States | 3 yr Retrospective Cross-Sectional Study | 7 pediatrics EDs; 21,069 patient visits | 1) Administration of any analgesic or opioids and 2) Reduction of moderate to severe pain related to long bone fractures | Compared to NH whites, minority children more likely to receive any analgesics (NH African American: aOR 1.72 [95% CI 1.51–1.95]; Hispanic: aOR 1.32 [95% CI 1.16–1.51]); but less likely to receive opioids: NH African American: aOR 0.86, Hispanics: aOR 0.86. Minority children achieved less optimal pain reduction (NH African American: aOR 0.78 [95% CI 0.67–0.90]; Hispanic: aOR 0.80 [95% CI 0.67–0.95]) |
| Goyal et al., 2015; National Database, United States | Cross-Sectional Study, National Survey of Different EDs | 0.94 million ED visits | Receipt of pain medication for children diagnosed with appendicitis | Black patients with moderate pain were less likely to receive any analgesia than whites: 15.7% (95% CI, 0.1%-39.5%) vs 58.5% (95% CI, 45.8%-71.1%), adjusted OR=0.1 (95% CI, 0.02–0.8). For severe pain, blacks were less likely to receive opioids than whites: 24.5% (95% CI, 1.1%-48%) vs 58.3% (46.1%-70.4%), adjusted OR=0.2 (95% CI, 0.06–0.9) |
| Ortega et al., 2013; Minnesota, United States | Retrospective, Cohort | 878 patients | Receipt of opioid pain medication at ED discharge for long bone fractures | Whites as reference: Biracial (RR, 0.45; 95% CI, 0.27–0.75), NH black (RR, 0.59; 95% CI, 0.42–0.75), and Hispanic/Latino (RR, 0.61; 95% CI, 0.42–0.89). Non-whites less likely to receive opioids upon discharge. |
| Johnson et al., 2013; Philadelphia, United States | Retrospective, Cohort | 2,298 ED visits | Receipt of pain medications for abdominal pain | NH black patients had a significantly less likelihood to be administered any analgesic (OR 0.61; CI 0.43–0.87) or a narcotic analgesic (OR 0.38; 95% CI 0.18–0.81) compared to NH whites. |
| Kipping et al., 2018; Washington DC, United States | Retrospective, Cross-sectional | 24,733 ED visits | 1) Receipt of pain medication for abdominal pain, and 2) Pain reduction | Black children compared to white children were at greater likelihood to receive analgesia (aOR 1.94; 95% confidence interval, 1.71–2.21). Blacks (aOR 0.66; 0.51–0.85) and Hispanics (aOR 0.56; 0.39–0.80) were less likely to receive opioids. Black children were more likely to report reduced pain score (aOR, 1.42; 1.13–1.79). |
| Hambrook et al., 2010; United States (National) | Retrospective | 818 ED visits | Receipt of pain medication for chest pain | Receiving at least one pain medication: Caucasian 79%, African American 77%, 'other' 65%, P=NS. Children living in metropolitan areas were more likely to receive pain medication than those from non-metropolitan areas (p<0.01). |
| Caperall et al., 2013; Pittsburgh, PA, United States | Retrospective | 9,424 ED visits | Receipt of pain medication for abdominal pain | Narcotics for abdominal pain related to different causes: White 17.8%, African American 10.4% (p value <0.001). Racial differences for receiving pain medication for pain related to appendicitis was not statistically significant. |

NH: Non-Hispanic, aOR: Adjusted odds ratio

130 PATIENT- AND PROVIDER-LEVEL PREDICTORS OF INAPPROPRIATE IMAGING IN PEDIATRIC UROLOGY REFERRALS

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10.1136/jim-2021-WRMC.130

Purpose of Study Bedwetting (MNE), undescended testes (UDT), and retractile testes (RT) are common reasons for referral to pediatric urology. Practice guidelines in multiple specialties strongly discourage imaging for these conditions, yet imaging is still prevalent. We sought to identify patient and provider characteristics associated with an increased risk of unnecessary imaging studies.

Methods Used We identified all patients seen at our institution for MNE, UDT, or RT. Demographic information was collected, as were characteristics of the referring provider and practice setting. Personal, provider, and practice characteristics of patients with and without imaging were compared.

Summary of Results We identified 287 patients referred for testicular issues and 137 patients referred for MNE. Imaging was ordered by the referring provider for 45.7% (16/35) of RT patients, 24.1% (47/195) of unilateral UDT patients, 26.3% (15/57) of bilateral UDT patients, and 8.8% (12/137) of MNE patients. Patients with and without testicular imaging were similar in age (median age 3.13 vs 3.71 years, $p=0.50$), and patients with imaging for MNE were older than those without (median 15.1 vs 11.6 years, $p=0.0007$). Female and male patients with MNE were equally likely to have imaging performed prior to referral (OR=2.29; 95% CI: 0.69–7.56). Of 317 providers, 64 (15.1%) were advanced practice providers (48 nurse practitioners [NPs], 16 physician assistants [PAs]) and 253 (84.9%) were physicians. Compared with patients referred by physicians, NPs were more likely to order imaging for testicular location and MNE (OR=3.32 [95% CI: 1.4–7.9] and OR=8 [95% CI: 2.73–23.41], respectively), while PAs were equally likely to order imaging for both diagnoses (OR=0.44 [95% CI: 0.05–3.6] and OR=0.73 [95% CI: 0.04–13.8], respectively). Providers working in academic and non-academic practices were equally likely to order inappropriate imaging (OR=0.48; 95% CI: 0.16–1.44).

Conclusions Older children with MNE were more likely to undergo imaging, and NPs were more likely to order imaging for evaluating testicular location and MNE compared to physicians and PAs. These findings underscore the need for ongoing provider-level education on appropriate imaging for these conditions.

131 URINARY TRACT INFECTIONS AND ASSOCIATED RISK FACTORS IN CHILDREN WITH PRENATAL HYDRONEPHROSIS

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10.1136/jim-2021-WRMC.131

Purpose of Study The aim of this study was to describe the incidence of urinary tract infections (UTI) among children with prenatal hydronephrosis (PNH) and to identify associated risk factors.

Methods Used The researchers retrospectively reviewed children who presented with confirmed PNH at a single tertiary children's institution between 2012–2020. The primary outcome was the development of a UTI, defined as positive pyuria and single organism urine culture. Clinical data collected included sex, degree and laterality of hydronephrosis, and presence and degree of vesicoureteral reflux. Comparative analysis was completed using Fisher's exact test with P value <0.05 considered significant.

Summary of Results A total of 116 children with PNH were included in the study. Of these children, 7% developed a UTI during an eight-year follow-up period. On univariate analysis, there was statistically significant association between UTI rates and bilateral high-grade hydronephrosis ($p=0.01$). There was no significant association between UTI and sex, degree of hydronephrosis, unilateral hydronephrosis, or the presence of vesicoureteral reflux on univariate analysis. The cohort was 69% male and 31% female. At the first postnatal ultrasound, 40% had high-grade hydronephrosis (SFU grade 3–4), 44% had low-grade hydronephrosis (SFU grade 1–2), and 16% had resolved hydronephrosis. Of the hydronephrosis cases, 57% were unilateral and 43% bilateral. In this cohort, 92% underwent a voiding cystourethrography, with 12% found to have vesicoureteral reflux. Some required surgery including pyeloplasty in 28%, ureteral reimplantation in 3%, and Deflux injection in 2%. Of the cohort, 28% of patients had dilated ureter and 8% had a duplicated ureter.

Conclusions In this cohort of children with PNH, the incidence of UTI was 7%. Bilateral high-grade hydronephrosis was associated with increased risk of UTI.

132 VARIABLE DRUG AND ALCOHOL USE AMONG YOUTHS EXPERIENCING UNSTABLE HOUSING AND VARIABLE PARENTAL SITUATIONS

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10.1136/jim-2021-WRMC.132

Purpose of Study Drug and alcohol use has been noted as a significant problem among homeless youth populations. Within those populations, young people come from a variety of different parental marriage situations. Due to these different parental influences, the propensity of drug and alcohol use is also varied. This study looked at the influence of living with both parents or a single parent on youth drug and alcohol use.

Methods Used Surveys were distributed to homeless youth at first arrival for a day program at YouthHope Foundation in Redlands, CA. These surveys included demographic, social, and educational information questions. Data from these surveys was used to examine drug and alcohol use among the youth and their parents.

Summary of Results The results of the surveys showed that significant differences exist between youth coming from dual parent and single parent situations in regards to youth drinking ($p<.012712$), familial drinking problems ($p<.000037$), youth drug use ($p<.000798$), and familial drug uses problems ($p<.000021$). These values indicated that dual parent households are at 47% lower odds for familial drinking problems and 74% lower odds for youth drinking than single

parent households. In addition, dual parent households are at 42% lower odds for familial drug use problems and 68% lower odds for youth drug use than single parent households.

Conclusions In this study, there is a correlation between the parental situation of a household and family's drug and alcohol use. Based on this data, it can be suggested that having both parents in the home has a positive impact on reduced alcohol and substance use of the youth and family. Further exploration is needed to determine if there is any relationship between drug and alcohol use having a causality in the separation of families and pressuring of youths to use drugs and alcohol.

133 ARE HOUSING INSTABLE LGBTQ YOUTH AT GREATER RISK FOR ABUSE IN SAN BERNARDINO?

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10.1136/jim-2021-WRMC.133

Purpose of Study LGBTQ youths face many stigmas from society as well as their own family. A common reason for youth to run away from home is the abuse that they are subject to there. The purpose of this study was to determine if a subset of housing instable LGBTQ youth in the San Bernardino area has an increased risk for a history of abuse.

Methods Used Surveys were collected from youth at a drop-in youth program in Redlands, California totaling 1398 surveys over the course of 10 years. The youth surveyed upon entrance into the program were all housing instable and had a mean age of 17.99 years old. They ascertained the history of abuse as well as each individual's sexual preference. The surveys also collected information on ethnicity, mental illness history, education, relationship status, children, criminal history, parental marriage status, the location they sleep, history of street living, relationship with family, if they had run away or been kicked out before, history of alcohol and drug use, family history of alcohol and drug use, if they receive free lunches, and areas they need assistance in. Based on the information provided the surveys were divided into two groups based on answers to sexual orientation: LGBTQ or straight. Survey questions regarding the history of abuse and the type of abuse they experienced. The data was then analyzed using chi data squares and odds ratios.

Summary of Results There were 618 surveys completed. Statistics reveal that total youth (N=618) that housing instable LGBTQ youth (N=88) are at a greater risk for abuse than housing instable straight youth (N=530) (p-value <0.05). Straight individuals have 41% lower odds of being abused than an LGBTQ+ individual. Straight males had 27% lower odds of being abused than LGBTQ males. Straight females had a 38% lower odds of being abused than LGBTQ females.

Conclusions This study revealed that housing instable LGBTQ youth are at a greater risk for abuse in San Bernardino. Housing instable straight youth in San Bernardino are at a lower risk to have a history of abuse. Addressing stigma and biases experienced by those who are LGBTQ may be helpful in reducing the levels of abuse that they experience.

Hematology and oncology

Concurrent session

2:20 PM

Friday, January 29, 2021

134 EGFR, ERBB2 AND ERBB4 FUSIONS ARE RECURRENT ALTERATIONS IN MULTIPLE CANCER TYPES

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Purpose of Study Gene fusions involving the HER family of genes, *EGFR*, *ERBB2* and *ERBB4* are rare, but potentially amenable to treatment with targeted therapies. The incidence of these fusions across cancers has not yet been comprehensively described. We sought to assess the frequency and characteristics of fusions involving the HER family of genes.

Methods Used We utilized publicly available next generation sequencing data to assess the frequency of gene rearrangements involving *EGFR*, *ERBB2* and *ERBB4*. We queried the TCGA PanCancer Analyses, MSK Impact and AACR GENIE data bases through cBioPortal (accession dates 6/18/20, 8/8/20, 8/8/20 respectively).

Summary of Results The overall frequency of each type of fusion by data set is displayed in table 1. We found that *EGFR* fusions were most frequent in glioblastoma multiforme, oligoastrocytoma and astrocytoma. *ERBB2* fusions were found most often in breast cancer, stomach adenocarcinoma and cervical adenocarcinoma. *ERBB4* fusions were the least common overall, but most frequently found in breast cancer and non-small cell lung cancer. We assessed fusion partners in each category and the most common *EGFR* and *ERBB2* fusions were *EGFR-SEPT14* and *ERBB2-PPP1R1B*, respectively. There were no recurrent *ERBB4* fusions identified in this study. We evaluated these fusions for co-occurrence of mutations in tumor suppressor genes within the TCGA datasets. Interestingly, we found that *TP53* mutations cooccurred with *ERBB2* fusions more often than in samples without *ERBB2* fusions (74% in *ERBB2* fusions vs. 36% of non-*ERBB2* fusion samples).

Conclusions *EGFR*, *HER2* and *HER4* fusions are individually rare events but collectively represent up to 1% of all cancers, a significant number of patients with potentially actionable genomic alterations. These data highlight the importance of assaying for these mutations during clinical sequencing and suggest that further investigation into HER fusion biology and potential treatment options would be impactful.

Abstract 134 Table 1 Frequency of EGFR, ERBB2 and ERBB4 fusions

| Fusion | Overall Frequency | TCGA PanCancer (N= 10,967) | MSK IMPACT (N= 10,945) | AACR GENIE (N=96,324) |
|--------------|-------------------|----------------------------|------------------------|-----------------------|
| <i>EGFR</i> | 0.6% (752) | 0.3% (27) | 0.8% (88) | 0.6% (637) |
| <i>ERBB2</i> | 0.1% (173) | 0.5% (50) | | 0.1% (113) |
| <i>ERBB4</i> | | | | |

135 **CDK8-MEDIATOR COMPLEX PLAYS POSITIVE TRANSCRIPTIONAL ROLE IN MYC-AMPLIFIED MEDULLOBLASTOMA**

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10.1136/jim-2021-WRMC.135

Purpose of Study Medulloblastoma (MB) is the most common malignant pediatric brain tumor and a heterogenous cancer with four distinct molecular subtypes. Group 3 MB, characterized by MYC amplification, carries a poor prognosis with a 50–60% 5-year survival expectancy. Current molecular therapies fail to outperform the standard therapy of surgical resection, CSI, and adjuvant chemotherapy. This treatment outcome is unsatisfactory due to significant long-term therapy induced morbidity. Therefore, there is a critical need to identify effective novel therapeutic targets. In this study, we investigate the role of cyclin dependent kinase 8 (CDK8), a mediator complex-associated transcriptional regulator as it was identified in a CRISPR druggable target screen in MYC-amplified MB.

Methods Used Group 3 MB cells grown in DMEM supplemented with FBS, sodium pyruvate, penicillin-streptomycin, and non-essential amino acids or L-glutamine. Protein expression analysis completed with western blotting on 4–20% SDS-PAGE. Spheroid live cell imaging used to observe growth inhibition with titrated CDK8 chemical inhibitors Senexin B (10–2000 nM) and BI-1347 (0.25–50 nM).

Summary of Results Here we demonstrated the role of CDK8 in survival and proliferation of MB. We found amongst multiple MB subtypes, cells express CDK8 at levels 20 to 30-fold higher than normal cerebellum. Spheroid live cell imaging revealed marked reduction in cell growth with chemical inhibition of CDK8 with IC₅₀ in the nanomolar range (Senexin B IC₅₀ = 218.6 nM; BI-1347 IC₅₀ = 2.591 nM). We are investigating the biology of CDK8 in giving growth advantage to MYC expressing tumor cells and the impact of CDK8 depletion on mediator-complex stability.

Conclusions Our results suggest that CDK8 plays a positive transcriptional role in MYC-amplified MB. We hypothesize this is occurring through loss of kinase phosphorylation at the CTD of RNA polymerase II, an interaction well characterized in yeast. While CDK8 has previously been implicated in colorectal cancer and BCR-ABL leukemia, its role in MB has not been established. The mechanistic elucidation of CDK8 in MYC-amplified MB could provide further information into its potential role as a clinical therapeutic candidate.

136 **USE OF NATURAL PRODUCTS AND OVER THE COUNTER SUPPLEMENTS IN BREAST CANCER**

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10.1136/jim-2021-WRMC.136

Purpose of Study The aim of this study was to identify the current use of dietary supplements, including natural products (e.g. fish oils), vitamins and minerals, by those diagnosed with breast cancer (BrC), including concurrent use with BrC treatments, and to examine the primary source of information used when choosing to take these supplements.

Methods Used We developed an anonymous, online survey for subjects to self-report dietary supplement use as well as information regarding their diagnosis and treatment, recruiting patients through social media.

Summary of Results Of 749 participants, most were non-Hispanic (94%), Caucasian (88%), and female (100%), with ER+ (Estrogen Receptor +) and/or PR+ (Progesterone Receptor +) (58%) the most common reported BrC subtype and 57 years the average age at diagnosis. Half reported current hormone therapy use, with aromatase inhibitors being the most common (83.6%). Vitamin and/or mineral use was reported by 81.9%, with prevalence of use highest for: vitamin D (69%), calcium (46%), multivitamin (38%), and vitamin C (27%). A health care provider was the most common primary source of information when choosing to take vitamins/minerals (e.g. 89% of calcium use was health care provider recommended). Botanical supplement use was reported by 59%, the most common being: probiotic (21%), fish oil and/or omega-3 (22%), turmeric (18%), melatonin (17%), and cannabis (15%). The primary source of information for botanical supplement use was more diverse. For example, for turmeric, only 28% of use was health care provider recommended, with a similar prevalence (26%) attributable to information obtained via the internet. Some studies suggest antioxidant use with chemotherapy is associated with higher rates of breast cancer recurrence and mortality; thus it is concerning that 22% of patients undergoing chemotherapy were taking vitamin C simultaneously.

Conclusions A majority of women diagnosed with breast cancer reported use of vitamin/mineral supplements and natural product-based supplements, as well as concurrent breast cancer treatment, with use of the former primarily based on health care provider recommendations, whereas the decision to take natural products supplements is based on information from a variety of sources and may have associated risks.

137 **ASSOCIATIONS BETWEEN COFFEE OR TEA CONSUMPTION AND RISK OF UPPER AERODIGESTIVE TRACT CANCERS**

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10.1136/jim-2021-WRMC.137

Purpose of Study Upper aerodigestive tract cancers (UADTC), which comprise oral, pharyngeal, esophageal, and laryngeal cancers, are a major global burden with approximately 1,407,000 new cases and 940,000 deaths annually. Given growing evidence for the anti-cancer effects of coffee and tea, we performed a meta-analysis to investigate whether there is a dose-dependent association between UADTC risk reduction and consumption of these beverages and to identify which regions in the world may experience the strongest benefit from these effects.

Methods Used We used PubMed, Embase, and Scopus to search for observational studies that assessed the relative risk of UADTC with coffee or tea intake up to June 2020. Relevant and high-quality studies were selected by using the Newcastle-Ottawa Quality Assessment Scale for further data extraction and analysis. Summary relative risk (SRR) was determined by the DerSimonian and Laird random effects model, and dose response was estimated using linear regression.

Summary of Results A database search yielded 32 high-quality studies with 27,866 cases of UADTC. High coffee consumption (≥ 3 cups/day) exhibited a reduced risk of UADTC with an overall SRR of 0.79 (95% confidence interval: 0.69–0.89). A significant dose-response effect of coffee was observed in oral and pharyngeal cancers with 9.4% risk reduction per cup, but not in esophageal or laryngeal cancers. Importantly, decaffeinated coffee had no effect on preventing UADTC. Compared to coffee, high tea consumption (≥ 1.6 cups/day) had a smaller effect on reducing the risk of UADTC with an SRR of 0.87 (0.78–0.97). The dose-response effect of tea was also observed in oral and pharyngeal cancers with 6.3% risk reduction per cup. The effects of coffee on preventing oral and pharyngeal cancers were most prominent in Europe and North America, and the effects of tea were strongest in East Asia.

Conclusions Coffee or tea intake significantly reduces an individual's risk for oral and pharyngeal cancer in a dose-dependent manner. This meta-analysis is limited by imprecise measurements of beverage consumption, particularly in retrospective studies. Future studies should explore other factors that may modify the effects of coffee or tea on UADTC, such as temperature, concentration, and regional preparations of the beverage.

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CAFFEINATED OR DECAFFEINATED COFFEE CONSUMPTION AND RISK OF CANCER INCIDENCE: A META-ANALYSIS OF PROSPECTIVE COHORT STUDIES

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10.1136/jim-2021-WRMC.138

Purpose of Study Cancer is the second leading cause of death globally. Coffee consumption has been reported to reduce the incidence of various cancers. However, previous studies showed variable results, and few studies have addressed the effect of caffeinated versus decaffeinated coffee on cancer incidence. We performed a meta-analysis to investigate what types of cancer are prevented by caffeinated or decaffeinated coffee. **Methods Used** We utilized PubMed, Scopus, and Embase databases to comprehensively identify peer-reviewed cohort studies that associate coffee consumption with cancer risk. The Newcastle-Ottawa Scale was used to assess the quality of non-randomized studies in meta-analyses. Summary relative risk was calculated by using the DerSimonian and Laird random effects model. Dose response was analyzed by using linear regression.

Summary of Results A total of 65 studies for 10 major cancer types were used for our meta-analysis. For all 10 cancer types combined, we found a 7% decreased risk of developing cancer in individuals who consumed large amounts of coffee (relative risk (RR) 0.93, 95% confidence interval (CI) 0.89–0.97). Caffeinated coffee consumption significantly reduced the risk of hepatocellular, endometrial, and skin cancers by 46% (RR 0.54, 95% CI 0.39–0.74), 39% (RR 0.61, 95% CI 0.44–0.84), and 17% (RR 0.83, 95% CI 0.74–0.92), respectively, whereas decaffeinated coffee had less or no effect in these three cancer types. Significant dose-response effects of caffeinated coffee were observed in hepatocellular, endometrial, and skin cancers with 9.9%, 7.4%, and 7.8% risk reductions per cup, respectively. In contrast, consuming

caffeinated coffee may increase the risk of ovarian cancer (13% increase (RR 1.13, 95% CI 0.78–1.63)). Interestingly, decaffeinated coffee may reduce the risk of colorectal cancer (12% reduction (RR 0.88, 95% CI 0.73–1.07)). Coffee consumption had no association with risks of breast and prostate cancers.

Conclusions Our meta-analysis demonstrates that caffeinated coffee consumption decreases the risk of liver, endometrial, and skin cancers and may increase the risk of ovarian cancer. These findings suggest that caffeine may prevent some types of cancer.

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HISTONE DEMETHYLASE KDM4B: A NOVEL EPIGENETIC TARGET IN ATYPICAL TERATOID/RHABDOID TUMOR (ATRT)

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10.1136/jim-2021-WRMC.139

Purpose of Study Atypical teratoid/rhabdoid tumor (ATRT) is a highly aggressive childhood brain tumor. Current treatment options are limited with intensive chemotherapy and radiation which often create therapy-related toxicity that is especially critical in this young patient population. Previous studies reported the loss of SMARCB1, a member of ATP-dependent SWI/SNF chromatin remodeling complex, as the hallmark molecular feature of ATRT, creating an overall epigenetic dysregulation of ATRT genome. We utilized an unbiased epigenome-wide RNAi screen and identified KDM4B, a histone lysine demethylase 4B, as one of the novel epigenetic regulators that is critical for ATRT growth. Therefore, the objective of this study is to provide a mechanistic rationale for targeting KDM4B in SMARCB1 deleted ATRTs.

Methods Used ATRT cell lines and patient tumor samples were used to validate the screen through both genetic perturbation and pharmacologic small-molecule inhibition. Chromatin immunoprecipitation (ChIP) sequencing was performed to understand the epigenetic remodeling driven by KDM4B using these knockdown cells.

Summary of Results Genetic inhibition of KDM4B in ATRT has decreased cell viability by 79.3% and impaired the ability of tumor cells to form colonies. KDM4B has been shown to regulate oncogenetic pathways by demethylating the repressive mark, H3K9Me3, which promotes compaction in promoters. Here we found that suppression of KDM4B leads to a global increase in protein expression of H3K9Me3. This suggests an hinderance of transcriptional activation which is currently being explored using integrated ChIP and RNA-sequencing. Importantly, KDM4B is highly expressed in ATRT tumor cells and patient tumors compared to normal cells, thus making it is an excellent candidate to specifically target ATRT tumors while protecting the normal cells. In line with this, the small molecule inhibitors of KDM4B shows preferential suppression of ATRT cells in comparison to normal astrocytes.

Conclusions We anticipate this finding to implicate a promising translatable potential of KDM4B as a new target with a favorable therapeutic window. It additionally furthers our understanding of ATRT epigenetic biology and is a starting point to develop better targeted therapies that can be translated to the clinic.

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UNIVERSITY OF BRITISH COLUMBIA NEPAL SICKLE CELL PROJECT STATUS REPORT 2015–2020

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10.1136/jim-2021-WRMC.140

Purpose of Study In 2015 the University of British Columbia partnered with Creating Possibilities (CP), a charitable organization located in Dang, Nepal. Each year, a team of medical students is sent to assist CP in the long term management of sickle cell disease (SCD) in rural Western Nepal. Due to COVID-19 limitations, we were unable to travel to Nepal this year for the field component of our project. Instead, we took this opportunity to reflect on the project as a whole and create a project status report, outlining the past five years of work. The purpose of this report included: summarizing overall project progress, identifying future project directions, and improving communication amongst project stakeholders.

Methods Used To create the project status report, our team reviewed all project documents since 2015. We also conducted virtual interviews with previous team leads to clarify questions and fill in gaps. Project progress was assessed by comparing activities completed to date to the project's initial three main objectives.

Summary of Results The first objective of characterizing the prevalence of SCD among the Tharu population is currently ongoing. Since 2015, we have conducted large-scale screening of the Tharu population, with 4483 individuals having been screened by our team. Thus far, a hemoglobin S prevalence of 9.3% has been estimated. Our second objective of identifying barriers to SCD management is also ongoing. Since 2016, yearly focus groups and needs assessments have been conducted with community members and health workers. Common themes of barriers included accessibility, financial limitations, and education. Finally, our third objective of implementing sustainable solutions for long term detection and management of SCD still needs to be addressed.

Conclusions Screening and needs assessments will continue as we progress toward addressing our first two objectives. Following consultation with experts and a literature review, we have identified a pilot newborn screening program for SCD as the first step in addressing our third objective.

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QUALITY OF LIFE AND COMORBID MENTAL HEALTH CONDITIONS IN PATIENTS WITH CUTANEOUS T-CELL LYMPHOMA

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10.1136/jim-2021-WRMC.141

Purpose of Study Cutaneous T-cell lymphomas (CTCLs) are non-Hodgkin lymphomas that present in the skin. Previous research on CTCL indicates that quality of life (QoL) is decreased. Given that co-occurrence of mental health (MH) conditions in patients with cancer is as high as 58%, we seek to explore quality of life (QoL) for patients with CTCL and comorbid mental health conditions. In addition, we will place our results in context by comparing QoL in patients with CTCL to those with other dermatologic conditions such as non-melanoma skin cancer (NMSC), psoriasis, and vitiligo.

Methods Used A cross-sectional, anonymous electronic survey was administered via a link posted on the Cutaneous Lymphoma Foundation (CLF) Facebook page and via email listserv to members of the CLF from February-April 2019. The survey included two validated instruments: Skindex-16 and the Functional Assessment of Cancer Therapy: General (FACT-G). Numeric results were additionally compared to existing data for other skin conditions.

Summary of Results 372 total survey responses were received, with 73 incomplete responses. 45% of respondents reported at least one MH condition. The emotional subscale of Skindex-16 was objectively higher than both symptoms and functioning subscales, indicating worse QoL for those with comorbid MH conditions. Fact-G also assesses QoL, with lower scores corresponding to worse QoL. The emotional well-being subscale score was comparable to other subscale scores including physical well-being, social/family well-being, and functional well-being.

Conclusions Roughly half of respondents with CTCL in our study had comorbid MH conditions. QoL for patients with CTCL is negatively affected by MH conditions. When compared to other research on CTCL using the same study instruments, our overall QoL is similar or slightly lower. QoL for our cohort was generally worse than that of patients with NMSC and vitiligo, and similar to psoriasis.

Neonatology general III

Concurrent session

2:20 PM

Friday, January 29, 2021

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PREDICTORS OF VENOUS THROMBOEMBOLISM IN NEONATES: A PEDIATRIC HEALTH INFORMATION SYSTEM STUDY

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Purpose of Study The prevalence of venous thromboembolism (VTE) is increasing in newborns. However, this trend is not well understood. We sought to: 1) examine the prevalence of VTE in neonatal patients 2) assess patient-level and hospital-level risk factors for VTE and 3) examine secondary outcomes related to VTE including length of stay and mortality.

Methods Used We included infants <6 months discharged from Pediatric Health Information System (PHIS) NICUs between Jan. 1, 2016-Dec. 31, 2019. Multivariable logistic regression examined associations between VTE and demographic factors (birthweight, sex, race, ethnicity), socioeconomic status (insurance), and hospital region. We also examined clinical factors (hyperalimentation, mechanical ventilation, infection, extracorporeal membrane oxygenation (ECMO), operations).

Summary of Results 201,033 infants were included; 2,319 (1.15%) had a VTE. Infants who had a VTE were of lower birthweight and gestational age. There was variability among hospitals in incidence of VTE (0.1–4.7%). In multivariate

Abstract 142 Table 1 Regression of clinical factors on VTE adjusting for demographics, insurance, and hospital location

| | Odds Ratio | 95% Confidence Interval |
|------------------------|------------|-------------------------|
| TPN | 16.70 | (14.34, 19.46) |
| Mechanical Ventilation | 10.47 | (9.25, 11.85) |
| Infection | 5.73 | (5.21, 6.30) |
| ECMO | 14.38 | (12.21, 16.93) |
| Operation | 8.65 | (7.87, 9.50) |

analysis, birthweight <1000 grams (OR 3.03, 95% CI [2.65–3.46]), 1000–1500 grams (OR 1.77, 95% CI [1.51–2.06]) vs. 2500–<4000 grams, and public insurance (OR 1.20, 95% CI [1.09–1.32]) vs. private insurance were associated with significantly increased risk of VTE; while Black race (OR 0.87, 95% CI [0.77–0.99]) and other race (OR 0.71, 95% CI [0.58–0.86]), vs. White, were associated with significantly lower risk of VTE. In multivariable regression assessing clinical factors, TPN, mechanical ventilation, infection, ECMO, and surgery were associated with significantly increased risk of VTE (table 1). Mortality (13.4% vs. 3.5%, $p < 0.001$) and length of stay (mean 65 ± 28 vs. 21 ± 65 days, $p < 0.001$) were significantly increased among infants with VTE.

Conclusions Neonatal VTE was significantly associated with low birthweight, White race, public insurance, TPN, mechanical ventilation, infection, ECMO, and surgery. Infants with these characteristics may require closer monitoring for VTE.

143 SOCIODEMOGRAPHIC FACTORS ASSOCIATED WITH ATTENDANCE AT HIGH RISK INFANT FOLLOW-UP CLINIC AMONG NEONATES WITH HYPOXIC ISCHEMIC ENCEPHALOPATHY

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10.1136/jim-2021-WRMC.143

Purpose of Study Hypoxic ischemic encephalopathy (HIE) is a leading cause of neurologic injury amongst term neonates. HIE patients should be followed longitudinally by a multidisciplinary team through a high risk infant follow-up (HRIF) clinic. While studies have evaluated lack of follow-up among premature infants, few have examined HIE patients, a group at high risk for neurodevelopmental deficits.

Methods Used Retrospective analysis of infants with HIE born between 2010–2016 and discharged from the UCSF Benioff Children's Hospital Oakland NICU. Data was collected from the California Perinatal Quality Care Collaborative database.

Abstract 143 Table 1 Characteristics of infants with follow-up vs infants with no follow-up.

| | Follow-up n=146 | No follow-up n=46 | p-value |
|--|-----------------|-------------------|---------|
| Female | 65/144 (45.1%) | 18/46 (39.1%) | 0.47 |
| Hispanic | 51/114 (44.7%) | 7/30 (23.3%) | 0.03* |
| Public insurance | 116/146 (79.4%) | 29/46 (63.0%) | 0.024* |
| Primary caregiver education beyond high school | 54/97 (55.7%) | 6/16 (37.5%) | 0.18 |
| Primary caregiver employed | 51/101 (50.5%) | 9/24 (37.5%) | 0.25 |
| Primary language at home is English | 89/120 (74.2%) | 27/34 (79.4%) | 0.53 |
| Household distance to HRIF clinic | 24.4 ± 23.3 mi | 15.6 ± 11.2 mi | 0.017* |

Abstract 143 Table 2 Summary of multivariate analysis for characteristics predicting follow-up

| Infant variables | Odds Ratio | 95% CI | p-value |
|--|------------|------------|---------|
| Female | 3.16 | 0.68–14.67 | 0.14 |
| Hispanic | 2.82 | 0.47–16.90 | 0.26 |
| Public Insurance | 5.6 | 0.81–38.60 | 0.08 |
| Household distance to HRIF Clinic | 1.05 | 0.99–1.11 | 0.12 |
| Primary caregiver education beyond high school | 5.08 | 1.04–24.72 | 0.04* |
| Primary caregiver employed | 1.73 | 0.41–7.37 | 0.46 |
| Primary language at home is English | 2.34 | 0.40–13.54 | 0.34 |

Sociodemographic characteristics associated with at least one follow-up visit at HRIF were examined.

Summary of Results Of the cohort of 192 babies, 146 (76%) had at least one HRIF visit. On univariate analysis Hispanic ethnicity ($p = .03$), public insurance ($p = .024$) and greater household distance from BCHO ($p = .017$) were associated with follow-up. On multivariate analysis, primary caregiver education beyond high school was most strongly associated with follow-up [OR 5.1, $p = .04$, 95% CI (1.04–24.7)].

Conclusions Awareness of caregiver educational level may offer an opportunity for targeted interventions to improve follow-up rates at HRIF clinic.

144 THE IMPACT OF LOW HEMATOCRIT AT BIRTH ON VERY LOW BIRTH WEIGHT INFANTS

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10.1136/jim-2021-WRMC.144

Purpose of Study Low hematocrit (HCT) at birth has been associated with intraventricular hemorrhage (IVH) in extremely premature infants. However, there is limited evidence of other neonatal outcomes in those with a low HCT. This study aims to evaluate the effects of low HCT at birth on neonatal outcomes in very low birth weight infants (VLBW).

Methods Used Retrospective data of all VLBW infants born at LAC + USC from 2009–2019 was gathered. Low HCT at birth was defined as a value of 40% or less. Short term neonatal and long term developmental outcomes were analyzed against low HCT.

Summary of Results Of 311 patients included in the study, 97 (31.2%) had low HCT at birth compared to 214 (68.8%) with normal HCT. Presence of a low HCT at birth was significantly associated with presence of acidemia in cord blood gas at delivery (24.2% vs 9.9% $p = 0.001$). Infants with low HCT were more likely to have a lower birth weight (1025 g

Abstract 144 Table 1 Regression analysis of infants with low HCT adjusting for gestational age.

| | Adjusted P Value | Odds Ratio | 95% CI |
|---------|------------------|------------|-------------|
| IVH (%) | 0.002 | 2.53 | 1.41 - 4.54 |
| BPD | 0.019 | 2.08 | 1.13 - 3.82 |
| ROP | 0.037 | 2.28 | 1.05 - 4.97 |

vs 811 g, $p < 0.001$) and gestational age (GA) (28.2 w vs 25.8 w, $p < 0.001$). These infants also had lower 5 minute APGAR scores ($p < 0.001$) and were significantly more likely to need intubation at birth (56% vs 43.4% $p = 0.046$), chest compressions in delivery room (23.1% vs 13.6% $p = 0.045$), and use of epinephrine in delivery room (7.9% vs 2.6% $p = 0.038$). Infants with low HCT levels were also significantly more likely to have IVH (60.5% vs. 28.1% $p < 0.001$), severe IVH (11.2% vs 2.1% $p = 0.001$), bronchopulmonary dysplasia (BPD) (53.8% vs 24.6% $p < 0.001$), retinopathy of prematurity (ROP) (81.7% vs 43.1% $p < 0.001$), and severe ROP (22% vs 8.9% $p = 0.004$). Long term developmental outcomes were not significantly affected for infants born with low HCT.

Conclusions VLBW infants with low HCT at birth may require more extensive resuscitation at the time of delivery and are at higher risk to develop IVH, BPD and ROP. Long term neurodevelopmental outcomes may not be significantly affected in infants born with low HCT.

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NEURODEVELOPMENTAL OUTCOME AT 18 MONTHS OF CORRECTED AGE FOR LATE PRETERM INFANTS BORN AT 34 AND 35 GESTATIONAL WEEKS

R Nakasone*, K Fujioka, K Iijima. *Kobe University Graduate School of Medicine, Kobe, Japan*

10.1136/jim-2021-WRMC.145

Purpose of Study This study aimed to evaluate neurodevelopmental outcomes at 18 months of corrected age of late preterm infants (LPI) born at 34 (LPI-34) and 35 (LPI-35) gestational weeks (GW) and to elucidate factors predicting neurodevelopmental impairment (NDI).

Methods Used Records of all LPI born at 34 (n=93) and 35 (n=121) GW from 2013 to 2017 were reviewed. Patients with congenital or chromosomal anomalies, severe neonatal asphyxia, and patients without developmental quotient (DQ) data were excluded. Psychomotor development was assessed as a DQ using the KSPD at 18 months of corrected age. NDI was defined as $DQ < 80$ or the condition that neurodevelopmental assessment was impossible because of severe neurological disability. The clinical characteristics and DQ value of the subjects were compared between LPI-34 (n=62) and LPI-35 (n=73). To elucidate the factors predicting NDI at 18 months of corrected age, we compared the clinical factors between NDI (n=17) and control (n=118) groups. Differences were deemed statistically significant for $p < 0.01$.

Summary of Results No significant difference was found in DQ values at 18 months of corrected age between the groups in each and all areas. Among clinical factors, intraventricular hemorrhage (IVH), hyperbilirubinemia, and severe hyperbilirubinemia had high prevalence rates in the NDI group, and

Abstract 145 Table 1 Psychomotor development data of the late preterm infants born at 34 and 35 gestational weeks

| | LPI-34 (n=62) | LPI-35 (n=73) | P-value |
|---|---------------|---------------|---------|
| All areas | 92 ± 9 | 92 ± 11 | 0.74 |
| Postural-motor | 89 ± 13 | 90 ± 13 | 0.71 |
| Cognitive-adaptive | 93 ± 12 | 93 ± 13 | > 0.99 |
| Language-social | 90 ± 11 | 88 ± 12 | 0.37 |
| Neurodevelopmental impairment (DQ < 80) | 9 (15) | 8 (11) | 0.53 |

Data are expressed as median (range), means ± SD, or number (%).

IVH and/or severe hyperbilirubinemia showed the highest Youden Index values for predicting NDI (0.284, $p < 0.001$).

Conclusions No significant difference in neurodevelopmental outcome at 18 months of corrected age was found between LPI-34 and LPI-35. Thus, routine neurodevelopmental evaluation for both LPI-34 and LPI-35 might be beneficial to detect NDI.

Surgery I

Concurrent session

2:20 PM

Friday, January 29, 2021

146

SIMULATION OF POST-PROCEDURAL COMPRESSION ON AUTOLOGOUS FAT GRAFTS: A PILOT STUDY

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10.1136/jim-2021-WRMC.146

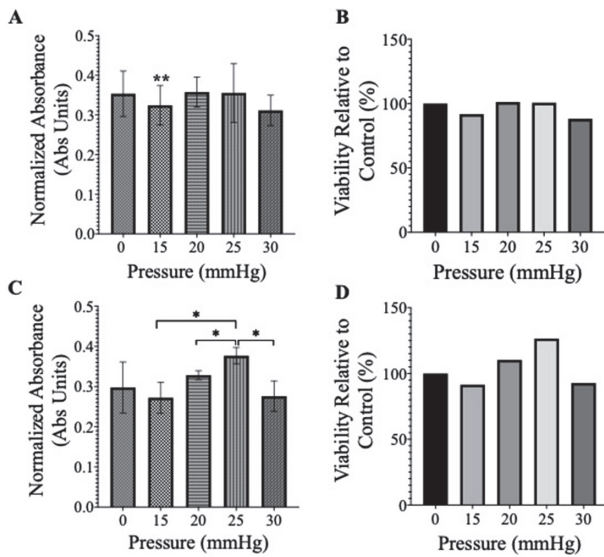
Purpose of Study Autologous fat grafting, or autologous fat transfer (AFT), is a procedure during which fat is grafted from one part of the body to another. AFT is widely used, but the impact of post-procedural care options remains largely unstudied. This study examined the impact of post-procedural compression on adipocyte viability in an in vitro simulation of autologous fat graft under a compression garment.

Methods Used Adipose tissue was harvested with low-pressure liposuction from an abdominoplasty and buttock lift procedure and from a bilateral mammoplasty reduction. The tissue was placed into 3 oz plastic cups to a depth of 3 mm, and cups containing lead weights were stacked on top. The weights were used to simulate pressures ranging from 15–30 mmHg. The adipose tissue was incubated at 37°C, 5% CO₂ for 4 hours.

Adipocyte viability was measured with the alamarBlue assay. AlamarBlue reagent was mixed with the adipocytes in a 1:9 ratio. The mixture was incubated at 37°C, 5% CO₂ for 2 hours, then diluted 3x with Ringer's Lactate. Absorbance was measured at 570 nm.

Summary of Results Results are summarized in **Abstract 146 figure 1**.

Conclusions Compression was not found to significantly affect adipocyte absorbance and extrapolated viability. However, on select occasions moderate pressure (25 mmHg) seemed to increase adipocyte absorbance and viability while the higher pressure of 30 mmHg had the opposite effect. Further studies investigating this potential trend are warranted.



Abstract 146 Figure 1 The effects of compression on adipocyte viability. **A)** The absorbance of alamarBlue viability assays on adipocytes compressed at various pressures. This graph represents compiled data from 3 separate trials of the experiment, with each trial being conducted in triplicate. The x axis represents the different pressure conditions that were intended to simulate various pressures created by post-surgical compression garments. The y axis represents normalized absorbance by subtracting absorbance at 600 nm from absorbance at 570 nm, as indicated by the alamarBlue protocol. Normalized absorbance was directly proportional to adipocyte viability. Compression at any or the pressures was not found to significantly affect adipocyte viability compared to the control condition of 0 mmHg. **B)** Relative viability of adipocytes compressed under various pressures compared to the control of 0 mmHg, using compiled data from 3 separated experimental trials. The x axis represents the different pressure conditions, while the y axis represents % viability of the experimental group compared to the control group with an assigned viability of 100%. **C)** The absorbance of alamarBlue viability assays on adipocytes compressed at various pressures, from the second trial of the experiment. Samples were set up in triplicate for each pressure condition. The axes possess the same meanings as those in graph A. This graph demonstrates a trend observed over two of the experimental trials, each using adipocytes from a different patient: while no statistically significant differences in absorbance were observed in the compiled data, on select occasions 25 mmHg of Pressure was found to increase adipocyte absorbance (and thus viability) while 30 mmHg was found to decrease adipocyte absorbance and viability. For this trial, significant differences were observed between 25 mmHg and the other pressurized conditions of 15 mmHg, 20 mmHg, and 30 mmHg. **D)** Relative viability of adipocytes from the second experimental trial compressed under various pressures compared to the control condition of 0mmHg. The axes possess the same meaning as those in graph B. *p<0.05
**average of 8 replicates

147 FAT GRAFT HARVEST ERGONOMICS: CHARACTERIZATION OF FORCE BASED ON ANATOMICAL LOCATION AND CANNULA SIZE

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10.1136/jim-2021-WRMC.147

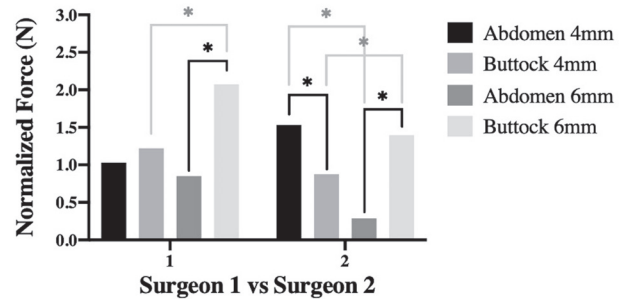
Purpose of Study ForceData, a force measuring smart phone application, was used to characterize the applied force generated during liposuction of different anatomical locations, patients and cannula sizes.

Methods Used The force of liposuction was measured from two surgeons using a 4-mm diameter (416 g) cannula and a 6-mm diameter (322 g) cannula on the abdomen and buttock of patient 1, and the abdomen of patient 2. An iPhone wrapped in a sterile drape was strapped to the mid-dorsal surface of a surgeon's forearm with IV tubing. Force measurements were collected every 0.04s for 1 minute. Peak force values were normalized to a biological zero obtained by stimulating liposuction in air.

Summary of Results The buttock, a high resistance area, produced consistent results with the 6-mm cannula: the 6-mm cannula produced more force than the 4-mm cannula and the buttock required more force than the abdomen (figure 1). The abdomen, an expected lower resistance area, and the use of the 4-mm cannula, produced less consistent results. Patient 1, with a history of multiple abdominal surgeries, required more force exerted than the patient 2 (figure 2).

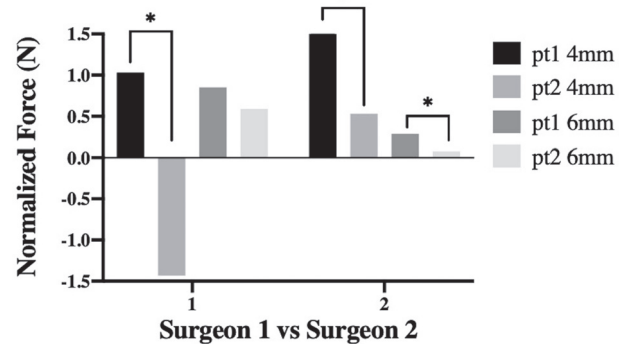
Conclusions Results were consistent with the qualitative description of forces exerted by the surgeons. The use of the ForceData app during fat harvesting procedures is a promising method of characterizing the forces exerted during liposuction.

Patient 1 ForceData



Abstract 147 Figure 1 Force exerted from Surgeon 1 and Surgeon 2 in Patient 1's abdomen and buttock with a 4-mm diameter cannula and 6-mm diameter cannula. Black brackets - comparing locations with same cannula Gray brackets- comparing cannulas in the same location *Indicates a significant difference p<0.05

Patient 1 vs Patient 2 ForceData



Abstract 147 Figure 2 Comparison of force exerted the in abdomen of Patient 1 and Patient 2 by Surgeon 1 and Surgeon 2 with a 4-mm diameter cannula and a 6-mm diameter cannula. * Indicates a significant difference p<0.05.

A PILOT STUDY TO EVALUATE A SIMPLE SHORT-TERM STORAGE METHOD FOR PRESERVATION OF HARVESTED LIPOASPIRATE

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10.1136/jim-2021-WRMC.148

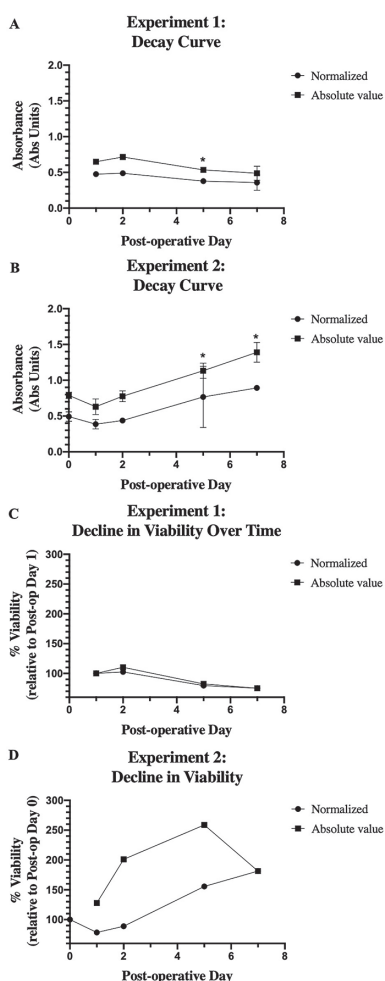
Purpose of Study Cryopreservation studies have been described in literature for long-term adipocyte storage, but no simple, validated method exists for storing adipocytes for short periods of time. The purpose of this study was to investigate the efficacy of a mixture of Ringer's Lactate (RL) and Dextrose 5% in Water (D5W) as a method of preserving adipocytes for up to a week after harvest.

Methods Used Adipocytes were harvested from a patient using liposuction with a 4-mm diameter cannula. Isolated adipocytes

after centrifugation were gently mixed in a 1:1 ratio with the preservation mixture consisting of 3-parts RL and 1-part D5W. The preserved adipocytes were stored at 4°C. An AlamarBlue assay was used to assess the viability of the adipocytes on postoperative days 1, 2, 5, 7 in experiment 1 and postoperative days 0, 1, 2, 5, and 7 in experiment 2. Absorbance values at 570 nm were compared using a t-test with an alpha value of 0.05. Relative percent viability was determined.

Summary of Results The results are presented in figure 1.

Conclusions This preliminary study suggests that a 1:1 fat to preservation solution (3-parts RL and 1-part D5W) mixture is a promising method of short-term preservation defined as a 48-hour post-harvest period. Further replication and additional studies are needed. Future studies should assess efficacy of the preservation mixture over longer periods of time.



Abstract 148 Figure 1 The effects of a preservation mixture on adipocyte viability over time. A mixture of one-part Ringer's Lactate (RL) and three-parts Dextrose 5% in Water (D5W) was added to a specimen vial in a 1:1 ratio with isolated fat cells. The mixture was stored at 4°C. A) An AlamarBlue assay was used to measure absorbance at 570nm. Absorbance from post-operative days 2, 5, 7 were compared to post-operative day 1 using a t-test. B) An AlamarBlue assay was used to measure absorbance at 570nm. Absorbance from post-operative days 1, 2, 5, 7 were compared to post-operative day 0 using a t-test. C) Relative percent viability was calculated with post-operative day 1 assigned as 100% viable. D) Relative percent viability was calculated with post-operative day 0 assigned as 100% viable.

*indicates $p < 0.05$

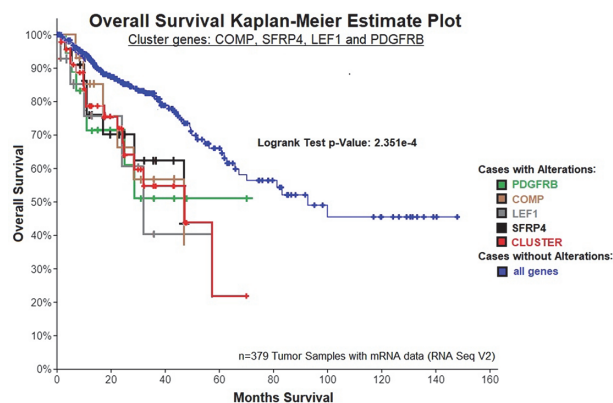
A CLUSTER OF COMP, SFRP4, LEF1 AND PDGFRB GENES PREDICTS WORSE SURVIVAL FOR COLON CANCER PATIENTS ESPECIALLY IN THE YOUNG

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10.1136/jim-2021-WRMC.149

Purpose of Study Colon cancer (CC) incidence has decreased overall in the last three decades but continues to increase in young patients. Early onset CC (EOCC) presents at advanced stage with more aggressive features. Expression of Cartilage Oligomeric Matrix Protein (COMP), Secreted Frizzled-Related Protein 4 (SFRP4), Lymphoid Enhancer Factor 1 (LEF1) and Platelet Derived Growth Factor Receptor Beta (PDGFRB) confer aggressiveness in EOCC. This study explores association between the co-expression of these genes and overall survival.

Methods Used CC and matching noninvolved tissues from 6 EOCC and 6 late-onset CC patients were obtained from pathology archives. Deparaffinized tissues were macro-dissected from FFPE sections, RNA isolated, and profiled for expression of 770 cancer-related genes. cBioPortal for cancer genomics was used for survival analysis of 379 patients from TCGA COADREAD database. Gene-level transcription estimates are shown as $\log_2(x+1)$ transformed RSEM normalized count.



Abstract 149 Figure 1

Summary of Results There is significant overexpression of COMP, SFRP4, LEF1 and PDGFRB in EOCC compared to late-onset. All four genes showed significantly poorer survival when they were queried individually with p-values as follows: COMP=0.0413, SFRP4=0.0277, LEF1=0.00306 and PDGFRB=0.0212. As a group, the decrease in overall survival was more profound with p-value 0.000235.

Conclusions COMP, SFRP4, LEF1 and PDGFRB are individually significantly overexpressed in EOCC and associated with poorer survival. When co-expressed, survival is significantly worse. Gene clusters are potential prognostic biomarkers for EOCC and aggressive CC in general.

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APPLYING PROCESS IMPROVEMENT TO AUTOLOGOUS FAT TRANSFER: RANKING QUALITY OF EVIDENCE

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10.1136/jim-2021-WRMC.150

Purpose of Study Autologous fat transfer (AFT) is a procedure where fat is grafted from one part of the body to another. Despite its various clinical uses, a standardized procedure for AFT does not exist, and there is large variability in reported outcomes. Clinical process improvement is the practice of identifying and improving existing processes to optimize performance and improve the outcome of a procedure. This study applied the process improvement method to evaluate the current quality of evidence for each step of AFT in order to highlight areas requiring further research.

Methods Used A literature search on PubMed was conducted for each step of AFT. The key words were ‘Autologous Fat Transfer/Grafting AND [step terms] AND [survival/outcome of interest]’. 130 articles were examined. An ‘A’ rank indicated that high-quality evidence such as large randomized clinical trials and prospective observational studies exist for that step. A ‘B’ indicated a mix of small clinical trials and anecdotal pieces. A ‘C’ indicated that only anecdotal, animal, and/or basic science literature exist, or that no supporting literature currently exists. Rankings of ‘A/B’ or ‘B/C’ were used when different aspects of the step had differing levels of evidence.

Summary of Results Results are summarized in table 1.

Conclusions A process improvement approach successfully revealed that the majority of the steps in AFT lack high-

| | |
|---|-----|
| Donor Site Preparation | - |
| Skin preparation | C |
| Tumescent fluid recipe | B |
| Cannula selection | B/C |
| Skin entry and closure | C |
| Interval from injection to harvest | B |
| Harvest of Fat Graft | - |
| Skin entry | C |
| Cannula characteristics | B/C |
| Sub-atmospheric pressure setting | B |
| Modality of energy | B |
| Harvest Ergonomics | - |
| Force and energy required | C |
| Rate of retrieval | C |
| Harvest Quality | - |
| Percent viable grafts | C |
| Ruptured adipocytes | B |
| SVF quantity | B |
| Fat quality | C |
| Fat consistency | C |
| Fat Isolation from Blood, Tumescence, Fibrous Particles (gravity, centrifuge, filtration, none) | B |
| Transfer of Fat to Placement Device | B |
| Admixture | B |
| Recipient Site Qualities | - |
| Skin preparation | C |
| Local anesthetic injection | C |
| Skin entry and closure | C |
| Fat Transfer | - |
| Syringe size | C |
| Needle or cannula choice and size | B/C |
| Depth of placement | B |
| Speed of placement | C |
| Volume transferred per recipient potential volume | B/C |
| Post-procedural Care (compression, elevation, massage, none) | C |
| Perioperative Systemic Pharmacology | B |

quality supporting evidence. Larger clinical trials are needed to standardize and optimize the AFT method.

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APPLYING PROCESS IMPROVEMENT METHODOLOGY TO AUTOLOGOUS FAT TRANSFER: A GUIDE TO FUTURE RESEARCH

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10.1136/jim-2021-WRMC.151

Purpose of Study Autologous fat grafting, or autologous fat transfer (AFT), is a procedure during which fat is grafted from one part of the body to another. Despite its wide range of clinical uses, a standardized process for AFT does not exist, and there is large variability in reported outcomes. Clinical process improvement is the practice of identifying and improving existing processes to optimize performance and improve the outcome of a procedure. A previous study by our group conducted a literature review to evaluate the current quality of evidence existing for each step of AFT. This study continued the process improvement of AFT by identifying the remaining research questions in order to organize progress towards optimization of AFT.

Abstract 150 Table 1 Ranked quality of evidence for each step of AFT.

| Step | Quality of Evidence Ranking |
|--|-----------------------------|
| Patient Selection | - |
| Age | A |
| BMI | A |
| Gender | C |
| Menopausal status | B |
| Cancer treatment and immunosuppressive medications | C |
| Diabetes | A/B |
| Skin Preparation | C |
| Donor Site Selection | A/B |

Methods Used Current quality of evidence for the AFT process was examined by evaluating this group's previous literature review and ranking of evidence. All of the 'C' ranking steps were selected. A 'C' ranking meant that the literature that existed for that step, if any, was anecdotal, animal, and/or basic science evidence. The studies supporting these steps were then revisited to determine which questions did not have definitive answers in the literature. These questions were then compiled into a table.

Summary of Results Results are summarized in table 1.

Conclusions There are many research questions regarding the AFT process with no high-quality evidence or minimal

Abstract 151 Table 1 Research questions for AFT without definitive answers in the current literature. Questions due to a lack of high-quality evidence are not bolded, while questions due to minimal evidence overall are in bold

| Step | Question to Answer |
|------------------------|---|
| Patient Selection | Does the menopausal status of women affect fat graft retention/outcomes? Do cancer treatments (radiation therapy, chemotherapy, etc.) affect adipocyte viability and fat graft retention? Do hormone replacement therapies affect fat graft outcomes? Are there gender differences, male vs female, between AFT outcomes? |
| Donor Site Preparation | What is the best way to prepare the donor site in order to improve wound healing and decrease scar formation and infection rates? Does a sterile ice pack applied to the donor region for 20 minutes, which adds to the tissue firmness, allow for easier access into the donor site, improve wound healing and decrease scar formation? What is the optimal percentage of lidocaine used in tumescent solution for pain control and adipocyte viability? What is the ideal concentration of epinephrine in the tumescent solution that ensures adequate vasoconstriction while maximizing adipocyte viability? Is lidocaine the best local anesthetic to use in fat graft tumescent solution? What type and size of tumescent solution injection needle ensures equal dispersion of fluid and preserves adipocyte viability? What is the best cannula diameter size to use for autologous fat transfer? Are there any additives to the tumescent solution that improve efficiency of harvest and adipocyte viability? What is the optimal number of cannula holes that produces the greatest adipocyte viability? What is the optimal arrangement of cannula holes for adipocyte viability? For efficiency of harvest? What is the optimal size/area of cannula holes for adipocyte viability and efficiency of harvest? What is the optimal shape of the cannula holes for adipocyte viability and efficiency of harvest? Does the use of compression and closed cell medical grade foam minimize post-harvest bruising of donor area? |
| Harvest of Fat Graft | What is the effect of using lidocaine and other local anesthetics on adipocyte viability? What are the optimal characteristics for liposuction cannulas to preserve adipocyte viability? (number of holes, shape of holes, arrangement of holes, and overall surface area of holes) |

| | |
|-------------------------------------|--|
| Harvest Ergonomics | What are the forces and energy exerted on adipocytes and on the surgeon during liposuction/adipocyte retrieval? How do different fat harvesting methods compare in terms of the stress and fatigue they put on the surgeon? What rate of retrieval is optimal for both adipocyte viability and cost-efficiency? |
| Harvest Quality | Is there a threshold of harvested adipose tissue viability that is predictive of graft volume retention? |
| Transfer of Fat to Placement Device | How many transfers between the centrifuged syringe and the injection syringe would ensure homogenization of the adipocytes and adipocyte-derived stem cells while maximizing adipocyte viability? |
| Recipient Site Qualities | What is the best way to prepare the recipient site in order to improve wound healing and decrease scar formation and infection rates? Does a sterile ice pack applied to the recipient site for 20 minutes, which adds to the tissue firmness, allow for easier access into the recipient site, improve wound healing and decrease scar formation? Does the use of compression and closed cell medical grade foam minimize post-harvest bruising of the injection area? What local anesthetic concentration should be used at each injection point to ensure the greatest alleviation of pain and retention of the fat graft? Does injection of epinephrine to the acceptor site affect the fat graft retention? |
| Fat Transfer | What size of syringe is optimal to use for fat graft placement? What are the optimal characteristics for cannulas and needles used to place the fat graft (diameter, number of holes, shape of holes, arrangement of holes, and overall surface area of holes)? Which is better to use for fat injection, needles or cannulas? What is the optimal depth of placement of fat for breast augmentation? What is the optimal speed of injection for fat graft placement? What is the optimal pressure of injection for fat graft placement? What is the optimal volume of fat per recipient potential volume to inject into different locations on the body? |
| Post-procedural Care | What is the optimal post-procedural care regimen for fat graft retention? What are the effects of compression, elevation, and massage on adipocyte viability? |

evidence of any quality to answer them. Further studies to answer these questions are warranted in order to improve AFT outcomes.

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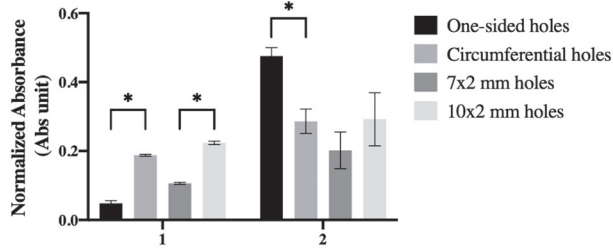
IDEAL CANNULA CHARACTERISTICS FOR INCREASED ADIPOSE CELL VIABILITY IN AUTOLOGOUS FAT GRAFTING MEASURED WITH ALAMAR BLUE ASSAY

A Park, H Peterson, S Gupta. *Loma Linda University School of Medicine, Loma Linda, CA*

10.1136/jim-2021-WRMC.152

Purpose of Study Process improvement autologous fat grafting techniques have been described in literature but few address cannula hole characteristics and none have conducted studies

Canula Characteristics: Absorbances



Abstract 152 Figure 1 Comparison of absorbance between cannula hole arrangement and cannula hole size in Experiment 1 and Experiment 2.

* Indicates a significant difference $p < 0.05$

in which hole characteristics are compared when all other parameters, such as cannula diameter and hole number, are constant. Two groups of cannula pairs were used to collect fat through liposuction from female patients in order to compare adipocyte cell viability based on cannula hole arrangement and size.

Methods Used Group 1 compared 2-mm 3-holed cannulas arranged in a circumferential and one-sided fashion. Group 2 compared 4-mm 3-holed cannulas with 7 mm x 2 mm and 10 mm x 2 mm hole sizes. Besides the characteristic in question, all other parameters were equal. The lipoaspirate collected from each cannula were centrifuged. The isolated adipocytes were mixed in a 1:1 ratio with a preservation solution (3-parts RL and 1-part D5W). Cell viability was analyzed through an AlamarBlue assay. Absorbance values at 570 nm were compared using a t-test with an alpha value of 0.05. The experiment was replicated twice. Experiment 1 was analyzed a day post-operation while Experiment 2 was analyzed the day of.

Summary of Results The results are presented in figure 1.

Conclusions This preliminary study suggests that cannula hole arrangement and an increase in cannula hole area does not hold a significant effect on adipocyte viability in liposuction procedures. Further replication and additional studies are needed. Future studies should compare cannula holes of various different arrangements and sizes along with a comparison between different numbers of holes.

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EXAMINING THE DISEASE BURDEN OF THE DIFFUSE SCLEROSING VARIANT OF PAPILLARY THYROID CARCINOMA, A RETROSPECTIVE REVIEW

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10.1136/jim-2021-WRMC.153

Purpose of Study Little data exists on the clinical course of the diffuse sclerosing variant (DSV) of papillary thyroid carcinoma (PTC); however limited reports suggest it is a more aggressive variant of differentiated thyroid carcinoma. We aim to characterize the disease burden at initial presentation, treatment outcomes, and clinical course for patients with DSV compared to a cohort of PTC patients.

Methods Used Single institutional retrospective review of patients undergoing treatment for PTC and its variants at Seattle Children's Hospital from 1/1/05 to 4/1/20. Patients

were included in the study if they had their initial thyroid surgery at Seattle Children's and were under the age of 23 years old at the time of presentation. Statistical analysis was performed using descriptive statistics and the Fisher Exact Test.

Summary of Results A total of 72 patients were included in the study; 63 (87.5%) with PTC and 9 (12.5%) with DSV. Mean follow-up times for DSV and PTC were 29.88 ± 8.91 months and 37.84 ± 6.32 months. DSV patients required surgery at a younger age than PTC (14.63 ± 2.23 years and 15.61 ± 0.72 years). DSV were significantly more likely to have with regional cervical ($n=9$ vs $n=38$, $p < 0.03$) and distant metastasis ($n=6$ vs $n=14$, $p < 0.02$) at time of presentation. Of those with 5-year follow-up data available, DSV were significantly less likely to be disease free ($n=0$ vs $n=20$, $p < 0.05$) and were significantly more likely to experience persistence and/or progression of disease, compared to PTC ($n=8$ vs $n=28$, $p < 0.02$). DSV were significantly more likely to have RET-CCDC6 mutation ($n=3$ vs $n=1$, $p < 0.02$).

Conclusions Our findings contribute to the understanding of DSV's prognostic significance as patients had a worse disease burden related to age at surgery, metastasis, persistence and progression of disease compared to PTC. This will help clinicians prepare patients and families for the potential of more aggressive primary surgery as well as for the possibility of persistence and/or progression of disease. Finally, we showed an association between DSV and the RET-CCDC6 mutation. Larger studies are needed to confirm the association between the RET-CCDC6 mutation and DSV as novel therapies targeting the RET protein may change disease management.

Genetics II

Concurrent session

3:15 PM

Friday, January 29, 2021

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MECP2 MUTATIONS IN TWO MALE PATIENTS AND NATURAL HISTORY OF THE DISEASE

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Purpose of Study MECP2 pathogenic variants cause Rett syndrome (OMIM 312750). It is an X-linked neurodevelopmental condition characterized by loss of spoken language and hand use with the development of distinctive hand stereotypies. Initially normal progress is followed by a period of regression. Other characteristic features are feeding problems, seizures and severe intellectual disability. It is predominantly in females with a high rate of early loss in hemizygous male pregnancies.

The function of MECP2 protein is not completely understood. It binds to methylated CpGs and can both activate and repress transcription. It is required for maturation of neurons and is developmentally regulated. The majority of RTT-causing mutations are *de novo* events.

Methods Used Recent studies have shown male patients with MECP2 mutations with higher phenotypic variation. The clinical spectrum of Rett syndrome in males is considered to be wider than previously expected. Both clinical symptoms and specific genetic mutations might modulate disease severity. Males with MECP2 mutations display quite significant neurodevelopmental issues.

Summary of Results We report here on two male patients with MECP2 pathogenic variants of non-consanguineous European parents. One of them is the oldest male patient described. Thus, this will lighten the natural history of the male disease phenotype. Other patient is a young toddler and other one is in his 40's. They have different pathogenic variants in MECP2 gene found in exome sequencing. Detailed clinical and molecular description will be presented.

We demonstrate that some consistent clinical features occur in male with MECP2 mutations, including features similar to females with RTT. However, these features are variable and remain less distinctive than in females. Clinical involvement in males with MECP2 mutations is remarkably broad, ranging from cognitive impairment to neonatal encephalopathy associated with early death.

Conclusions In conclusion these findings provide broader insights into the MECP2 in males and extend the mutation spectrum and describe natural history of the disease. MECP2 is a severe and progressive condition with a grave prognosis. Securing a diagnosis provides crucial information to the family.

155 ATYPICAL PRESENTATION OF IMPRINTING DEFECT ANGELMAN SYNDROME WITH EXPRESSIVE LANGUAGE

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Purpose of Study Describe an atypical presentation of Angelman syndrome (AS) with expressive language.

Methods Used Chart review, literature review, and clinical evaluation. Genetic testing included cytogenomic SNP microarray, fragile X (FMRI) studies, AS/PWS methylation studies.

Summary of Results A 16-year-old boy initially presented due to obesity, hyperphagia, and intellectual disability. He was reported to have hypotonia as an infant. At 3 years of age he developed hyperphagia, and he was obese by 7 years. His speech and language milestones were severely delayed with first word approximately at 7 years. Currently, he speaks in 3–5 word phrases. He has a no history of seizures. Initial testing included normal cytogenomic SNP microarray and normal fragile X (FMR1) studies. AS/PWS methylation studies came back positive for AS with no evidence of mosaicism.

Conclusion AS is an imprinting disorder caused by disruption of the maternally inherited *UBE3A* gene in the 15q11.2-q13 region. AS is usually characterized by severe developmental delay, seizures, absent speech, gait ataxia, and happy demeanor. Individuals with atypical AS with history of hyperphagia, obesity, and verbal language ability have been described. A recent study of 22 individuals with mosaic AS found similarities which included developmental delay and preserved expressive language skills. Mosaicism in AS is believed to occur due to a postzygotic loss of imprinting in some of the cell lines, resulting in a somatic mosaicism.

While it is tempting to speculate that this individual is also a mosaic AS given his clinical presentation, there was no evidence for mosaicism in the blood sample. To our knowledge this is the first description of an individual with AS with preserved expressive language skills where mosaicism was not identified, although mosaicism in other tissues has not been tested. This case illustrates the atypical phenotypic spectrum of AS and need for additional evaluation when confronted with atypical clinical features of a well described genetic syndrome.

156 A CASE OF FAMILIAL *COL4A1* MUTATIONS, AN IMPORTANT DIFFERENTIAL DIAGNOSIS ON NEONATAL PORENCEPHALY

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Case Report We describe two siblings with *COL4A1* mutations and porencephaly presenting in early infancy. Our goal is to contribute to the literature supporting the assessment for this condition in neonatal stroke and porencephaly.

Patient 1: Presented at 6 months with global developmental delay and hemiplegic cerebral palsy (CP). Pregnancy was remarkable only for preterm labor at 30 weeks, requiring steroids. Patient was born via vaginal delivery at 38 1/7 weeks. Initial eye exam showed esotropia, amblyopia, hypermetropia and astigmatism. Family history was positive for hemiplegic CP and seizures in a 4-year-old sister (patient 2). MRI brain showed severe white matter volume loss, cystic encephalomalacia, ex-vacuo dilatation of lateral ventricles, small left thalamus and thin corpus callosum. Whole genome sequencing (WGS) revealed a paternally inherited, heterozygous, likely pathogenic variant in *COL4A1*, affecting the canonical splice site.

Patient 2: Presented at 6 months with GDD and asymmetrical tone, and later developed global developmental delay and seizures. Eye exam showed bilateral esotropia and hypermetropia. MRI brain showed large bilateral porencephalic cysts and later periventricular leukomalacia as well. WGS revealed the same mutation as sibling.

We present a case of familial porencephaly, one of the 5 *COL4A1* related disorder phenotypes. It is characterized by fluid-filled cavities in the brain, caused by prenatal or perinatal parenchymal hemorrhage. Symptoms include infantile hemiparesis, seizures, intellectual disability, dystonia, stroke and migraine. The AHA 2019 neonatal stroke statement recommends considering mutations in *COL4A1* in neonates with porencephaly. Our case supports these recommendations. As father of the proband also harbors the variant, brain MRI, eye exam, UA and CK, hypertension management, smoke cessation, and avoiding anticoagulants were recommended.

COL4A1 mutations are now recognized as a cause for hereditary porencephaly. There are actionable recommendations for surveillance and circumstances to avoid for both the proband and family. *COL4A1* mutation should be part of the differential in porencephaly and perinatal stroke, even without a family history.

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A CONNECTION BETWEEN BREAST CANCER AND HIRSCHSPRUNG DISEASE? THE ANSWER MAY JUST BE *RET* UNDER OUR NOSES

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Purpose of Study Hirschsprung disease (HSCR) is a congenital absence of the myenteric and submucosal neural plexus of the GI tract with severity dependent on affected segmental length. Loss of function variants in the *RET* proto-oncogene have been associated with HSCR. Gain of function variants in *RET* typically lead to increased risk for tumorigenesis, including breast cancer. Here we present an individual with total colonic and ileal HSCR due to a *RET* variant found also in the mother diagnosed with ductal carcinoma in situ (DCIS) breast cancer. To our knowledge there is no similar inheritance or mechanism for breast cancer reported in the literature, which has implications for counseling and management.

Methods Used Chart review, physical examination, literature review, and targeted sequencing.

Summary of Results Here we describe a 5 yo boy with total colonic and ileal biopsy-proven HSCR diagnosed at birth after failure to pass meconium. He had an early expressive speech delay that has since resolved and no other medical concerns. Physical exam was unremarkable. His mother was diagnosed with DCIS at 34 yo and found to have a heterozygous pathogenic loss of function variant in exon 6 of *RET*, likely present in a mosaic state. Targeted testing of the familial variant was performed, and was detected in our patient.

Conclusions Our case is illustrative of a severe isolated HSCR phenotype due to a loss of function *RET* variant inherited from a mother with breast cancer. The role of *RET* in breast cancer is still being investigated but has been implicated in ER + breast cancer with over-expression being a negative prognostic factor. Interestingly, there has been one report of two

RET variants typically associated with Multiple Endocrine Neoplasia type 2 that are associated with a relatively high percentage of long segment and total colonic HSCR (Coyle et al., 2014). If, as we hypothesize, this variant is associated with both severe HSCR and breast cancer, it would be the first described with this inheritance pattern and another example of increased pathogenicity of this particular variant in association with a disorder of oncologic significance, and further supports the role of *RET* variants in the pathogenesis of breast cancer.

Neonatology general IV

Concurrent session

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Friday, January 29, 2021

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EFFECT OF BRAIN TEMPERATURE AND INJURY SEVERITY ON APPARENT DIFFUSION COEFFICIENT CHANGES IN NEWBORNS UNDERGOING THERAPEUTIC HYPOTHERMIA

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Purpose of Study Apparent diffusion coefficient (ADC) changes are useful in detecting ischemic brain injury by the principle that cytotoxic edema restricts Brownian motion of water molecules. Other than pathology, brain temperature may affect the kinetic movement of water. We hypothesize that lower temperature conditions such as therapeutic hypothermia (TH) is associated with lower ADC values.

Abstract 158 Table 1 Brain Temperature and ADC values during and after therapeutic hypothermia

| | Brain T (°C) | ADC (10 ⁻⁶ mm ² /s) | Brain T (°C) | ADC (10 ⁻⁶ mm ² /s) | ΔT (°C) | ΔADC (10 ⁻⁶ mm ² /s) | P value |
|--------------------------|--------------|---|--------------|---|---------|--|--------------------|
| All (N=34) | 33.5±0.9 | 842±120 | 36.5±0.9 | 935±160 | 3.0±1.2 | 96±108 | |
| Thalamus (N=34) | 33.2±0.9 | 753±95 | 36.3±0.9 | 841±126 | 3.1±1.2 | 87±109 | |
| BG (N=34) | 33.4±1.0 | 852±96 | 36.4±0.9 | 921±125 | 3.0±1.4 | 69±71 | |
| GM (N=33) | 33.7±0.8 | 837±79 | 36.7±0.8 | 950±126 | 3.0±1.0 | 113±102 | |
| WM (N=15) | 34.1±1.2 | 1056±125 | 37.4±1.1 | 1240±203 | 3.3±1.2 | 184±229 | |
| Normal-Mid (N=22) | 33.4±1.0 | 838±86 | 36.6±0.8 | 910±84 | 3.2±1.1 | 65±53 | P<0.0001 |
| Thalamus (N=22) | 33.1±1.0 | 763±51 | 36.4±0.6 | 820±38 | 3.2±1.0 | 57±50 | |
| BG (N=22) | 33.2±1.1 | 849±64 | 36.5±0.9 | 903±45 | 3.3±1.5 | 54±53 | |
| GM (N=22) | 33.6±0.8 | 831±46 | 36.8±0.7 | 919±55 | 3.3±0.8 | 89±35 | |
| WM (N=7) | 34.2±1.4 | 1062±69 | 37.7±1.4 | 1135±28 | 3.6±2.3 | 73±65 | |
| Mod-Severe (N=12) | 33.7±0.8 | 867±171 | 36.3±1.1 | 1057±240 | 2.6±1.3 | 191±187 | P<0.0001 |
| Thalamus (N=12) | 33.2±0.7 | 732±158 | 36.0±1.3 | 909±207 | 2.8±1.4 | 178±164 | |
| BG (N=12) | 33.7±0.6 | 868±151 | 36.2±1.0 | 986±209 | 2.5±1.2 | 118±96 | |
| GM (N=12) | 33.9±0.7 | 840±123 | 36.1±1.1 | 1042±195 | 2.1±1.2 | 202±193 | |
| WM (N=9) | 34±1.0 | 1057±152 | 36.7±0.8 | 1253±153 | 2.7±1.0 | 197±264 | |

Methods Used Brain temperature (T) was measured by MR thermometry during and after TH. The injury severity was scored by pediatric neuroradiologist and dichotomized to normal-mild (NM) and moderate-severe (MS). We compared ADC values and T in thalamus, basal ganglia, parietal gray matter (pGM) and white matter (WM), and magnitude of ADC change between NM vs MS.

Summary of Results 34 infants with HIE (22 NM; 12 MS) were enrolled. Mean duration between scans was 3.7 ± 1.1 days. Mean ADC and T significantly increased during and after TH (table 1, all $p < 0.0001$). In NM group, whereby ADC changes due to injury evolution is minimal, ADC increased after rewarming (838 ± 86 vs. $910 \pm 84 \times 10^{-6}$ mm²/s, $p < 0.0001$). ADC value increased 25×10^{-6} mm²/s per degree Celsius (Δ ADC/ Δ Brain Temp). The magnitude of ADC change was significantly higher in MS (867 ± 171 vs. 1057 ± 240 , $p < 0.0001$). When comparing regions, pGM and WM had the greatest increase in ADC for all injury groups.

Conclusions Aside from brain injury, tissue temperature may contribute to diffusion restriction on MRI in infants with HIE during TH.

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ASSOCIATION BETWEEN UMBILICAL CORD MANAGEMENT AND 5 MINUTE PERIPHERAL OXYGENATION IN PRETERM INFANTS

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Purpose of Study Delay Cord Clamping (DCC) is recommended for all preterm newborns. However, effects of delaying resuscitation and oxygen administration in resuscitated preterm newborns are largely unknown. A recent post hoc exploratory analysis of the major TO2RPIDO trial done by Kei Lui et. al. found that infants with 80% or less 5-minute mean peripheral arterial oxygenation (SpO₂) were more likely to die or have neurodevelopmental impairment. This study aims to determine if resuscitated preterm infants that received DCC had lower 5-minute SpO₂ compared to those with umbilical cord milking (UCM) or early cord clamping (ECC).

Methods Used This was a retrospective review of resuscitated premature infants born between 2014-present at 23 to 31 weeks of gestation receiving either ECC (N=20), DCC (N=178), or UCM (N=130) before resuscitation. Data gathered was SpO₂ (measured by pulse oximetry), and various physiologic data including administered inspired fraction of oxygen (FiO₂). Mean 5-minute SpO₂ and FiO₂ levels of each treatment group were compared with 2-sample t tests for continuous variables using a critical alpha level of 0.05.

Summary of Results There were no statistically significant differences between the three groups using ANOVA for continuous measures and Chi square for categorical variables in maternal or neonatal demographics. Mean SpO₂ and FiO₂ at 5 minutes were compared. FiO₂ at 5 min was higher in ECC compared to UCM ($p=0.031$) and DCC ($p=0.025$), with no difference found between UCM and DCC. The 5-minute SpO₂ was higher in UCM compared to DCC (79.4%

vs 74.8%, $p=0.028$). There was no difference between mean 5-minute SpO₂ of ECC and UCM ($P=0.72$) or DCC ($p=0.16$)

Conclusions ECC and UCM allow for resuscitation to occur quickly and may lead to improvements in oxygenation within 5 minutes of life. However, both have increased risk of mortality or intraventricular hemorrhage. Despite receiving similar amounts of supplemental oxygen, infants receiving DCC had a lower 5-min SpO₂ compared to UCM. Providing higher supplemental oxygen during DCC or immediately following clamping and cutting of the umbilical cord may improve 5-minute SpO₂ and neonatal outcomes.

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HIGHER RATES OF READMISSION FOR PHOTOTHERAPY IN TERM INFANTS EXPOSED TO DELAYED CORD CLAMPING

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Purpose of Study To compare the need for phototherapy during birth admission and readmission for hyperbilirubinemia requiring phototherapy in term infants with immediate cord clamping (ICC) vs. delayed cord clamping (DCC).

Methods Used Retrospective study of term infants born at LAC+USC Medical Center between 2016–2019. Demographics, clinical data, and duration of DCC were collected from electronic medical records and paper records. Infants with ABO incompatibility were excluded. Data was analyzed with Wilcoxon Rank Sum and Chi Square test. Associations of hemoglobin level, rate of readmission and delayed cord clamping were determined with linear and logistic regression respectively.

Summary of Results There were 149 infants included in the study. Demographics were not different between the two groups except for Hispanic race. Hemoglobin level was higher in infants with DCC. The rate of infants exposed to phototherapy was not different, but the rate of readmission was

Abstract 160 Table 1 Demographics and outcomes between groups

| | Immediate cord clamping n=83 | Delayed cord clamping n=66 | P value |
|--|------------------------------|----------------------------|---------|
| Birth weight (g)* | 3320 (2980, 3750) | 3420 (3125, 3720) | 0.69 |
| Gestational age (wks)* | 39 (38, 40) | 39 (38, 40) | 0.74 |
| Hispanic Race n (%) | 22 (26.51) | 33 (50.00) | 0.01 |
| Hemoglobin at 24 hours of life (g/dL)* | 16.3 (14.7, 18) | 17.7 (16.2, 19.6) | <0.001 |
| Phototherapy n (%) | 11 (13.8) | 16 (26.7) | 0.06 |
| Readmission for phototherapy n (%) | 3 (3.6) | 9 (13.9) | 0.03 |
| Type of feeding | | | 0.14 |
| Breast feeding n (%) | 19 (23.6) | 24 (37.5) | |
| Formula feeding n (%) | 19 (23.6) | 15 (23.4) | |
| Mixed feeding n (%) | 43 (53.1) | 25 (39.1) | |

*Median (25th percentile, 75th percentile)

higher in infants with DCC. (Table 1) This association persisted after adjustment of confounders in a regression model. Hemoglobin level [Coef. 1.46 (95% CI; 0.65–2.2 p=0.001); Rate of readmission [OR=4.6 (95% CI; 1.13–19.92) p=0.03] **Conclusions** Delayed cord clamping in term infants did not result in an increased rate of phototherapy during birth admission, however, the rate of readmission for phototherapy was higher. The importance of outpatient bilirubin follow-up should be emphasized to parents.

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QUALITY IMPROVEMENT INITIATIVE TO INCREASE THE CONSISTENCY AND EFFECTIVENESS OF IRON SUPPLEMENTATION FOR NICU PATIENTS

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Purpose of Study We devised and conducted a program aimed at reducing iron deficiency among infants of diabetic mothers, small for gestational age neonates, and very low birth-weight premature neonates in the NICUs of Intermountain Healthcare.

Methods Used This was a quality improvement project establishing iron dosing guidelines among multihospital NICUs and assessing; 1) compliance with the guidelines, and 2) iron deficiency at one month.

Summary of Results During the ten years before establishing guidelines, only 18% of >4000 NICU patients in the three at risk groups had iron dosing begun by hospital discharge; only 3% had it begun before 2 weeks of age. During the 30 months since guideline initiation, 98% (534/543) had iron started before discharge and 74% (399/543) had it started by 2 weeks. Dosing as early as seven days resulted in no more intolerance (episodes of emesis/day) than when dosing was started at 2, 3, or 4 weeks. However, even when dosed according to guidelines, 16.0% were iron deficient at one-month (as judged by RET-He <25 pg). None who received a transfusion were iron deficient. Iron deficiency was found in 26.1% of 153 who received darbepoetin *vs.* 3.3% of 122 who did not receive darbepoetin (p<0.001).

Conclusions Iron dosing increased considerably after instituting guidelines. Earlier enteral iron was tolerated just as well as late enteral iron. Certain patients, including some darbepoetin recipients, apparently needed more iron than we provided. Further advances are needed to assure iron sufficiency of all NICU patients.

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NEONATAL HYPOTENSION AND RELATIONSHIP WITH CEREBRAL SATURATION

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Purpose of Study Neonatal hypotension can be defined by various threshold mean arterial blood pressures (MAP) such as 30 mmHg, postmenstrual age (PMA), or gestational age (GA) ± 5 mmHg. Cerebral saturation (cNIRS) is non-invasively measured by a near-infrared spectroscopy sensor on the forehead and assesses perfusion to a critical end-organ, the brain. We hypothesize that currently used MAP ranges do not correlate with cNIRS changes in neonates on dopamine for hypotension.

Methods Used Clinical data were reviewed for neonates admitted to the NICU and treated with dopamine between August 2018 and August 2019. Vital signs and lab values during treatment were collected from the electronic medical record. Definitions of hypotension included MAP less than PMA, 30 mmHg, PMA at time of therapy ± 5 mmHg, and GA ± 5 mmHg. Values were compared to time with cNIRS <55%, a lower limit for adequate cerebral oxygenation. Patients were stratified by PMA during therapy.

Summary of Results 70 patients were treated with dopamine with average GA of 34.3 ± 5.3 weeks, average birthweight of 2.29 ± 1.17 kg, and mean age at treatment of 36.2 ± 4.7 weeks. Infants experienced hypotension between 6–33% of their time on dopamine per examined definitions. Hypotension was more common in patients <36 weeks PMA than in term infants. Hypotension did not correlate with abnormal cNIRS overall or in PMA strata. Patients <29 weeks PMA had the greatest correlation between hypotension and abnormal cNIRS measures ranging from 5% using PMA threshold to 9% using 30 mm Hg threshold (table 1).

Abstract 162 Table 1

| | Overall | | | PMA < 29 weeks | | | PMA 29–37 weeks | | | PMA > 37 weeks | | |
|----------------------|-------------------------|--------------------------------------|--------------------------------|--|--------------------------------------|--------------------------------|--|--------------------------------------|--------------------------------|--|--------------------------------------|--------------------------------|
| MAP Threshold (mmHg) | % time below thresholds | Mean% time with concurrent low cNIRS | Average cNIRS when hypotensive | % time below thresholds (mean (st. dev)) | Mean% time with concurrent low cNIRS | Average cNIRS when hypotensive | % time below thresholds (mean (st. dev)) | Mean% time with concurrent low cNIRS | Average cNIRS when hypotensive | % time below thresholds (mean (st. dev)) | Mean% time with concurrent low cNIRS | Average cNIRS when hypotensive |
| PMA - 5 | 3 (7) | 0 (1) | 73 (12) | 21 (3) | 0 | 64 (12) | 4 (9) | 0 (1) | 78 (9) | 3 (6) | 0 (1) | 74 (13) |
| PMA | 15 (16) | 1 (3) | 73 (12) | 13 (9) | 5 (5) | 58 (8) | 20 (17) | 1 (3) | 72 (10) | 12 (17) | 1 (3) | 79 (11) |
| GA | 18 (18) | 1 (2) | 72 (13) | 18 (11) | 2 (2) | 58 (11) | 22 (16) | 1 (2) | 72 (10) | 15 (20) | 1 (2) | 78 (12) |
| GA - 5 | 3 (6) | 0 (1) | 76 (10) | 2 (2) | 0 | 77 (n/a*) | 4 (7) | 0 | 77 (9) | 3 (6) | 0 (1) | 75 (13) |
| 30 | 9 (15) | 1 (4) | 68 (13) | 33 (12) | 9 (7) | 57 (6) | 12 (13) | 1 (2) | 75 (10) | 1 (5) | 0 | 83 (15) |

*Single value. All values are mean (standard deviation).

Conclusions cNIRS as an indicator of brain oxygenation during periods of hypotension may be more clinically significant than MAP. cNIRS were mostly in a normal range, despite the frequency of MAP alterations in the neonatal population. More work is needed to determine what parameters are most appropriate to define and treat neonatal hypotension.

163 TRENDS IN GASTROSTOMY TUBE PLACEMENT AND RESOURCE UTILIZATION IN DOWN SYNDROME NEONATES IN THE UNITED STATES, 2006–2017

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10.1136/jim-2021-WRMC.163

Purpose of Study Feeding difficulty is one of the major comorbidities in neonates with DS. Consequently, some neonates with DS may require gastrostomy tube (GT) placement. However, there is paucity of data on rate and associated factors of GT placement in this population. We aimed to determine the trends in GT placement and resource utilization in DS neonates born at ≥ 35 weeks gestational age (GA) in the U.S from 2006 to 2017.

Methods Used Retrospective data analysis was performed using the National Inpatient Sample, the largest health care database in the US. We included all neonatal hospitalizations with GA ≥ 35 weeks who had International Classification of Diseases (ICD) 9th or 10th revision codes for DS and GT placement. Data was analyzed using trend analysis and multivariate logistic regression.

Summary of Results Over the study period, 1914 (3.7%) out of 51,463 neonates with DS had GT placement. Among neonates with GT, 46% were male, 24.8% were 35–36 weeks GA at birth, 48% White, 62% with Medicaid or self-pay, 95.1% in teaching hospital, and 69.9% in a large bed-size hospital. Rate of GT placement (per 100 neonates with DS) increased significantly from 2006 to 2017 (see table 1). On multivariate analysis, GA 35–36 weeks at birth was associated with increased odds of GT placement. Medicaid/Medicare insurance was associated with increased length of stay and hospitalization cost. Median length of stay and inflation adjusted hospital cost did not show any significant trend.

Conclusions Frequency of GT placement among neonates with DS increased significantly over the study period without any associated change in resource utilization. Future studies should probe the reasons and factors behind these trends.

Abstract 163 Table 1 Percent of DS neonates receiving Gtube

| Year | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | Total | p value |
|-------------------------|----------|----------|----------|----------|----------|----------|----------|---------|
| DS neonates per year | N=4135 | N=3982 | N=3688 | N=3809 | N=3968 | N=3786 | N=23368 | |
| Gtube placement,% (SEM) | 1.7(0.4) | 2.1(0.6) | 2.6(0.7) | 2.7(0.8) | 2.7(0.6) | 3.5(0.7) | 2.5(0.3) | 0.023 |
| Year | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | Total | p value |
| DS neonates per year | N=4715 | N=4455 | N=4665 | N=4430 | N=5125 | N=4705 | N=28095 | |
| Gtube placement,% (SEM) | 4.3(0.6) | 3.5(0.6) | 4.1(0.7) | 5.3(0.7) | 5.3(0.7) | 5.6(0.8) | 4.7(0.3) | 0.025 |

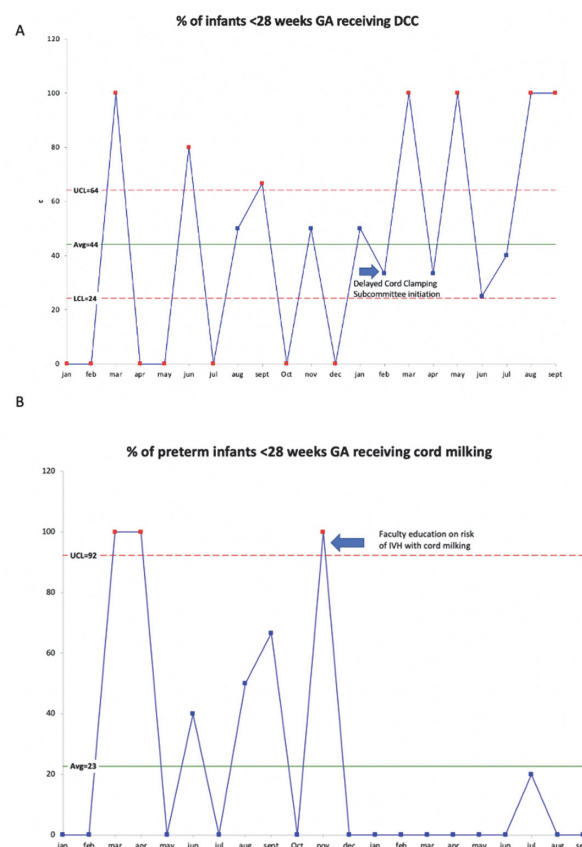
164 IMPROVING PLACENTAL TRANSFUSION RATES AT UCSD

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10.1136/jim-2021-WRMC.164

Purpose of Study Placental transfusion by delayed cord clamping (DCC) has significant benefits over immediate cord clamping in infants. However, less information is known about risks and benefits of cord milking. A recent study found an increased risk of intraventricular hemorrhage (IVH) in preterm infants who received cord milking. Due to the multidisciplinary involvement around placental transfusion, targeted actions to improve this metric can be complex.

Methods Used A multidisciplinary team was developed at UCSD Jacobs to decrease the rate of cord milking in preterm infants <28 weeks GA and to increase the rate of DCC in all infants. Multiple meetings were held to design a hospital policy on DCC. Education was given across all staff



Abstract 164 Figure 1

to ensure consistency in resuscitation care. Documentation of DCC will be used as the primary process measure. Balancing measures planned are frequency of phototherapy and IVH.

Summary of Results Baseline data in 2019 showed 81% of all infants born at UCSD received DCC; 51% in preterm and 84% in term infants. Results from the first PDSA cycle showed that DCC rates for preterm infants increased to 61%; rates for term infants were 83%. For infants <28 weeks GA, the % DCC increased from 29% to 65% (figure A) and cord milking decreased from 38% in to 2.2% (figure B).

Conclusions The rate of placental transfusion in preterm infants improved while reducing cord milking by implementing the first step of creating a multidisciplinary committee. The next step is to further streamline the resuscitation process for providers to further increase the rates of DCC.

165 THE EFFECTS OF PARENTAL LEAVE POLICIES ON PEDIATRIC FELLOWS

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10.1136/jim-2021-WRMC.165

Purpose of Study To identify the specific elements of parental leave policies among pediatric fellowship programs and to understand the impact of those elements on fellows.

Methods Used A national web-survey was sent to fellows at ACGME-accredited pediatric fellowship programs, either directly or through their program.

Summary of Results Of the 1474 fellows who opened the survey, 853 (58%) completed it. 76% of respondents were female. 43% reported having children among which approximately half reported having at least one child during fellowship. 48% of respondents did not know whether their program had a written policy governing parental leave.

Of fellows with knowledge of their program's parental leave policy, 61% and 24% stated the policy does not apply equally to fathers/partners and to adoption/fostering, respectively. Allowance of paid leave varied by program. 96% and 56% of fellows stated vacation/holiday time and sick time, respectively, is used to construct or extend leave. 34% of fellows reported they do not get sick leave. 73% indicated unpaid leave is used to construct or extend parental leave. 76% stated make up time is expected and 58% stated fellows often take on a greater than usual load of clinical responsibilities to 'pay for' their parental leave.

The mean satisfaction with parental leave policy score of the cohort was 3.0 (SD = 0.7) on a 5-point scale, with a score of 5 indicating highest satisfaction. Satisfaction scores did not differ by program size, a fellow's educational debt, or whether or not a fellow had children. Of 7 candidate changes to leave policy intended to minimize the stress of having or adopting a child during training, fellows chose establishing/extending paid leave and the cultivation of a more supportive culture among faculty and peers as the most impactful.

Conclusions Parental leave policies vary widely among pediatric fellowship programs, are often not known by fellows, and create substantial burden on fellows. Our results indicate fellows are not currently satisfied with parental leave policies in

fellowship and that there are a number of areas that would improve the experience of parental leave for fellows.

Pulmonary and critical care

Concurrent session

3:15 PM

Friday, January 29, 2021

166 HYPERGLYCEMIA AND HYPOGLYCEMIA CONTRIBUTIONS TO ACUTE RESPIRATORY DISTRESS SYNDROME

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10.1136/jim-2021-WRMC.166

Purpose of Study Non-diabetic COVID-19 patients with elevated admission fasting blood glucose levels ('hyperglycemia') inexplicably have an increased 28 day mortality and higher in-hospital complications including the Acute Respiratory Distress Syndrome (ARDS) but potentially contributing blood glucose changes during ARDS development were not reported (Wang S et al: *Diabetologia* 2020). Our goal was to determine blood glucose alterations before and during acute lung injury development in a rat model used to study ARDS.

Methods Used We sequentially evaluated blood glucose levels for 24 hours and lung lavage protein levels (lung permeability) and lung lavage neutrophil numbers (lung inflammation) at 24 hours to assess acute lung injury ('ARDS') in young (~3 month) and old (~12 month) control and a novel strain of hyperoxia surviving 'resistant' rats before and after administering high and low insulin doses and before and after interleukin-1/lipopolysaccharide (IL-1/LPS) insufflation.

Summary of Results Glucose levels increase rapidly and sequentially in young control, but not young resistant, rats peaking ~2 hours after insufflation. Glucose levels also increase in old control and old resistant rats after insufflation compared to young control and young resistant rats after insufflation. The pattern of glucose levels at 2 hours after insufflation resembles lung lavage proteins and neutrophils at 24 h after insufflation (table 1). Administering high insulin (High In) doses decreases glucose levels ('hypoglycemia') and worsens ARDS while administering low insulin (Low In) doses correct glucose levels and improve ARDS.

Conclusions Hyperglycemia develops in both young and old rats developing ARDS and high or low glucose levels parallel

Abstract 166 Table 1 Glucose and 'ARDS' After IL-1/LPS Insufflation

| Rat Type-Treatment | Glucose (mg/dL) | Protein (ug/ul) | Neutrophils (x 10 ⁶) |
|-----------------------|-----------------|-----------------|----------------------------------|
| Young Control-none | 163±28 | 1.90±0.58 | 57±9 |
| Young Resistant-none | 107±12 | 1.59±0.81 | 32±10 |
| Old Control-none | 252±85 | 7.30±1.14 | 85±28 |
| Old Resistant-none | 210±47 | 4.11±1.48 | 71±16 |
| Young Control-High In | 73±2 | 3.53±0.97 | 76±16 |
| Young Control-Low In | 131±16 | 0.81±0.30 | 38±17 |

worse acute lung inflammation and acute lung injury ('ARDS'). Controlling glucose judiciously with insulin may be beneficial in combatting ARDS caused by SARS-CoV-2 infection and other insults.

167 ASSOCIATION OF SMALL ADULT VENTILATION BAGS WITH RETURN OF SPONTANEOUS CIRCULATION IN OUT OF HOSPITAL CARDIAC ARREST

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10.1136/jim-2021-WRMC.167

Purpose of Study Excess minute ventilation adversely affects hemodynamics during cardiac arrest. In July 2017, Seattle Fire Department began using smaller ventilation bags, delivering approximately 450 mL per breath, in adults with out-of-hospital cardiac arrest (OHCA). We hypothesized that the rate of return of spontaneous circulation (ROSC) at hospital arrival would increase after this change.

Methods Used This retrospective analysis of prospectively acquired data evaluated adults treated for OHCA between January 1, 2015 and December 31, 2019 who received advanced airway management. Using waveform capnography, we calculated ventilation rate and mean end-tidal carbon dioxide (ETCO₂) values for each eligible minute during cardiac arrest. We examined whether ventilation rate, ETCO₂, and ROSC differed before and after the smaller ventilation bag implementation using linear and logistic regression.

Summary of Results Of the 1278 patients evaluated, 668 (52%) were treated with a small adult bag. Utstein characteristics did not differ between the two cohorts. Mean±SD ventilation rates were higher in the large bag cohort compared with small, 12.5±5.1 vs. 11.7±4.7, $p < 0.01$. Mean±SD ETCO₂ values were lower in the large bag cohort compared with small, 31.5±17.0 mmHg vs. 34.5±18.2 mmHg, $p < 0.01$. A ventilation rate > 18 was recorded in 10% of the 18,709 minutes evaluated. Mean ETCO₂ was less than 15 mmHg in 14% of all minutes. The incidence of ROSC on hospital arrival (39% vs. 34%) was not significantly different between the large and small bag cohorts ($p=0.07$). After adjusting for initial rhythm, age, witnessed arrest, and bystander CPR, ROSC on hospital arrival among the small bag cohort was not different (OR 0.82, CI 0.65–1.04).

Conclusions Use of a small adult bag during OHCA was not associated with a difference in incidence of ROSC. The clinical significance of the slight differences in ventilation rate and ETCO₂ are unclear. Hyperventilation was uncommon. Future studies should examine impact on downstream lung injury and acid-base status.

168 DIAGNOSTIC UTILITY OF POINT-OF-CARE ULTRASOUND IN THE EVALUATION OF NECROTIZING SOFT TISSUE INFECTIONS

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10.1136/jim-2021-WRMC.168

Purpose of Study Necrotizing soft-tissue infections (NSTIs) are potentially life-threatening medical emergencies that require rapid identification and aggressive treatment. Emergency physicians are utilizing point-of-care ultrasound (POCUS) for a wide variety of applications. The objective of this study was to determine the diagnostic utility of POCUS in the evaluation of patients with suspected SSTI in an Emergency Department (ED).

Methods Used This was a retrospective review of ED patients presenting to an academic center with symptoms suspicious for NSTI and received a POCUS. POCUS findings were collected from ED POCUS archiving database. Medical records were reviewed for history, physical examination findings, laboratory results, additional diagnostic testing, operative intervention, disposition, and final diagnosis. POCUS findings were compared with LRINEC scores and operative findings.

Summary of Results A total of 65 patients (15 females, 50 males; mean age, 55 years ± 13.6) were included in this study. Patients presented with pain (46/65), swelling (33/65), redness (28/65) and open wound (21/65). Most common symptomatic sites were feet (27%) and upper arm (21%). Nineteen patients reported injection drug use. In triage, 53% patients were tachycardiac and 5 patients were hypotensive. Pain out of proportion was documented in 3 patients. Based on operative findings, 38% (25/65) patients were found to have NSTI. All patients with final diagnosis of NSTI had sonographic findings (hypoechoic fluid tracking along deep fascial layers, fluid accumulation > 4 mm in depth along the deep fascial layers, air in the soft tissues) indicating NSTI on POCUS. In addition POCUS demonstrated abscess (28%), cellulitis (62%), pyomyositis (2.9%) and superficial Fasciitis (27%). Subcutaneous Gas was noted in 11 patients. Early surgical consultation was obtained in these patients prior to laboratory results and additional imaging studies. Six patients with LRINEC Score < 6 were found to have NSTI and all 6 patients had sonographic findings suggestive of NSTI on POCUS. Only 1 of these patients had abnormal vital signs in triage.

Conclusions Our study suggests that POCUS can be a useful adjunct in the evaluation of patients with NSTI. Integration of POCUS findings into LRINEC Score could improve risk stratification.

169 EMERGENT CRICOTHYROTOMY TRAINING FOR NON-SURGEONS

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10.1136/jim-2021-WRMC.169

Purpose of Study Cricothyrotomies are lifesaving procedures performed in critical care (CC) settings when an oral endotracheal (ET) intubation is not possible. Simulations are the main method of training and are most often performed in simulation labs on synthetic materials or pig tracheas. Cadaveric training is superior to simulation training due to landmark and tissue fidelity, but it is uncommon due to cost and access.

Methods Used We implemented a program to train CC fellows and attendings on cadaveric donors. The program was enhanced by an educational training video produced by our team and narrated by an ENT, as well as endoscopic visualization of the trachea that allowed participants to review their

technique. All participants performed both scalpel-bougie-6.0 ET tube and Seldinger kit methods.

Participants responded to a pre-survey that assessed their level of experience and anxiety with performing a cric. We then assessed for changes in their confidence after watching the video and after the cadaveric training. We reviewed the endoscopic recordings to assess any excursions of scalpels or needles beyond the midplane of the trachea. We also assessed procedure duration, puncture-to-tube time (PTTT), from initial entry to ET tube placement.

Summary of Results Response rate for the first session of 10 participants was 100% and showed that the session was helpful to all participants. 20 endoscopic recordings were analyzed, 10 from the bougie method and 10 from the kit method. They revealed that 1 trocar needle hit the posterior tracheal wall, and 2 scalpels passed the midpoint of the trachea lumen. PTTT ranged from 15–83 seconds (s), with 83s being a clear outlier and explained by a long coaching time. The mean PTTT with the outlier excluded was 29.2 ± 12.7 s. Additionally, during the training 1 bougie was placed parallel to the trachea but not within it. This was made immediately clear through the endoscopic visualization and feedback was given to the participant who was thereafter successful in intubating.

Conclusions Endoscopic enhancement of the emergent cadaveric cricothyrotomy training was valued by trainees. It helped detect 3 complications in 20 attempts which was important in refining trainee technique to avoid real-life complications and improve confidence. Adoption of ET endoscopy may enhance regional and national cadaveric emergent cricothyrotomy training programs.

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BARRIERS AND FACILITATORS TO LONGITUDINAL LUNG CANCER SCREENING: A QUALITATIVE STUDY

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10.1136/jim-2021-WRMC.170

Purpose of Study One of the implementation challenges faced by lung cancer screening (LCS) programs is replicating the high rate of adherence reported by the National Lung Screening Trial (NLST). The goal of this qualitative study was to identify factors influencing adherence and understand patients' attitudes towards a novel screening navigation program.

Methods Used We enrolled 40 participants, all of whom had a negative (LungRADS 1 or 2) baseline LCS CT. Participants were interviewed about their screening experiences as well as barriers and facilitators to follow-up. Interviews were transcribed, coded, and analyzed using thematic analysis.

Summary of Results Of 40 participants (22 men, 18 women, median age 66), 17 were adherent to screening follow-up while 23 were nonadherent. There were seven major themes that emerged from interviews of both groups: (1) most patients report favorable screening experiences and attitudes; (2) provider recommendation is a near-universal facilitator of baseline and follow-up screening; (3) while most patients understand lung cancer risk factors, some do not understand the importance of asymptomatic LCS; (4) concerns over insurance coverage, screening accessibility, and other medical conditions are often cited as barriers to ongoing LCS; (5) some

patients have residual questions about their results, LCS guidelines and the importance of follow-up; (6) reminders are an important facilitator of annual LCS; (7) most patients believe a navigator would be beneficial and emphasize the importance of a variety of services. Some differences were observed between the adherent and nonadherent cohorts. Adherent participants reported more interaction with their providers, while nonadherent participants reported less contact with providers and more frequent consideration of symptoms in their decision of whether or not to screen.

Conclusions Though patients' experiences with LCS are generally favorable, adherence may be improved by providing facilitators (such as reminders and transportation) and addressing barriers (such as lacking LCS knowledge) through an LCS navigation program. By targeting these deterrents of screening, LCS programs could improve adherence and better reproduce the benefits of LCS demonstrated by the NLST.

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POINT OF CARE ULTRASOUND EVALUATION OF AIRSPACE DISEASE BEFORE AND AFTER PROLONGED SURGERY

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10.1136/jim-2021-WRMC.171

Purpose of Study Point-of-care ultrasound (POCUS) has rapidly emerged as a modality to improve bedside assessment of pulmonary air-space disease. Indeed, POCUS has demonstrated to be superior for the assessment of air-space disease in comparison to both Chest x-ray and stethoscope auscultation. Given that patients undergoing a long surgical procedure requiring general anesthesia are at risk for pulmonary complications the ability to assess air-space disease perioperatively is of interest. The authors designed a pilot study to evaluate the utility of point of care ultrasound to evaluate the development of air-space disease in this patient population.

Methods Used Adult patients were screened for those undergoing a surgical procedure scheduled for more than 3 hours of surgical time. Patients were then scanned using a validated POCUS examination to detect both the presence and severity of air-space disease across 5 lung fields for each side (total of 10 views). POCUS exams were performed immediately before and after their surgical procedure. Air-space disease was defined by the presence of B-lines, as previously validated. Presence of air-space disease was compared to a threshold using binomial test. Level of significance was set to 0.05.

Summary of Results For our analysis we set a threshold value of 40% of the lung fields demonstrating B lines as the level of significance. Patients only surpassed this threshold after their surgery ($p = 0.03917$) and not before ($p = 0.2115$). All zones of lung parenchyma were able to be scanned on all patients.

Conclusions POCUS examination of the lungs fields can be successfully performed in the perioperative setting. Our preliminary data supports this tool to be useful in the assessment of the change in the aeration of lung tissue from pre to post surgery. Specifically, for patients undergoing long surgical procedures, this modality may be useful to detect the development of new areas of air-space disease.

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EMBOLIZATION OF SUPERIOR MESENTERIC ARTERIOVENOUS FISTULA IDENTIFIED DURING CONSULTATION FOR A TRANSJUGULAR INTRAHEPATIC PORTOSYSTEMIC SHUNT PROCEDURE

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10.1136/jim-2021-WRMC.172

Case Report The present case report describes a 75-year-old female patient with a history of two small bowel resections who presented with variceal bleeding resulting in hematemesis and bright red blood per rectum. She was initially referred to vascular and interventional radiology (VIR) for a transjugular intrahepatic portosystemic shunt procedure (TIPS). However, her past medical history and imaging indicated that the patient likely did not have cirrhotic liver disease, prompting further review of the imaging. Closer inspection of an abdominal computed tomography angiography scan identified a superior mesenteric arteriovenous fistula (SMAVF) as the probable etiology of the varices, the presence of which was confirmed on angiography. The fistula was embolized with a vascular plug and post-embolization angiogram demonstrated an absence of portal venous filling. Upper endoscopy at 1-month postprocedurally demonstrated complete resolution of varices.

The primary etiologies of SMAVF are traumatic, iatrogenic, and congenital. This rare vascular anomaly may be discovered incidentally, but more often presents with sequelae of portal hypertension, heart failure, or mesenteric ischemia. The presentation of SMAVF is widely variable, though common signs and symptoms include abdominal pain, diarrhea, upper or lower gastrointestinal bleeding, ascites, and anemia. The most consistent specific physical exam finding is an abdominal bruit. One of the most concerning complications is variceal bleeding as a result of portal hypertension, suspected to be the leading cause of mortality associated with SMAVF. If a SMAVF is initially not identified, such patients presenting with acute gastrointestinal bleeding might be referred for a TIPS procedure, as occurred in this case. However, careful review of the imaging can preclude the potentially catastrophic consequences of creating a portosystemic shunt in the presence of an existing SMAVF, including potentially life-threatening right-sided heart failure. This report highlights the necessity of the interventional physician performing a comprehensive consultation prior to invasive procedures.

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TIME-TO-PRESCRIPTION OF TRIKAFTA FOR REMOTE AND LOCAL PEOPLE WITH CYSTIC FIBROSIS

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10.1136/jim-2021-WRMC.173

Purpose of Study We aimed to describe time-to-prescription of Trikafta, a newly FDA approved cystic fibrosis (CF) therapy.

Methods Used We conducted a retrospective observational study to determine time-to-prescription of Trikafta in remote versus local people with CF. Among patients actively receiving care at the Providence Medical Group CF Center in Spokane, Washington, we included participants in the CF Foundation

Patient Registry who were eligible for Trikafta. Participants were dichotomized into remote (≥ 120 minutes of driving time from home to CF center ZIP code) and local (< 120 minutes) groups. The primary outcomes were prescription for and time-to-prescription of Trikafta. Analyses were completed using Kaplan-Meier and Cox proportional hazard models (controlling for insurance as a proxy for healthcare access) using an a priori $\alpha=0.05$.

Summary of Results Of the 84 participants, 36 (43%) were remote; median travel time to CF center was 45 minutes (interquartile range, IQR 20–160). The majority were male ($n=46$, 55%) and adults ($n=64$, 76%), with a median age of 27 years (IQR 22–33) among adults and 15 years (IQR 14–17) among children. Private insurance was used in 2019 by 51 (61%), and median time to prescription was 92 days (IQR, 43–132) for those who received a prescription. Eight months after FDA approval, 61% of remote participants were prescribed Trikafta, compared to 81% of local participants ($p=0.04$). Kaplan-Meier survival analysis, comparing prescription for and time-to-prescription of Trikafta, yielded no significant group differences ($p=0.28$). A Cox proportional hazard model, controlling for insurance type, reported no differences between local and remote groups ($p=0.11$).

Conclusions A smaller proportion of remote participants were prescribed Trikafta at the time of this analysis; however, the time to prescription did not differ by distance to CF center, even after adjusting for insurance type. At our center, caring for patients living at a median travel time of 45 minutes, timely delivery of novel therapies is achieved regardless of location.

Surgery II

Concurrent session

3:15 PM

Friday, January 29, 2021

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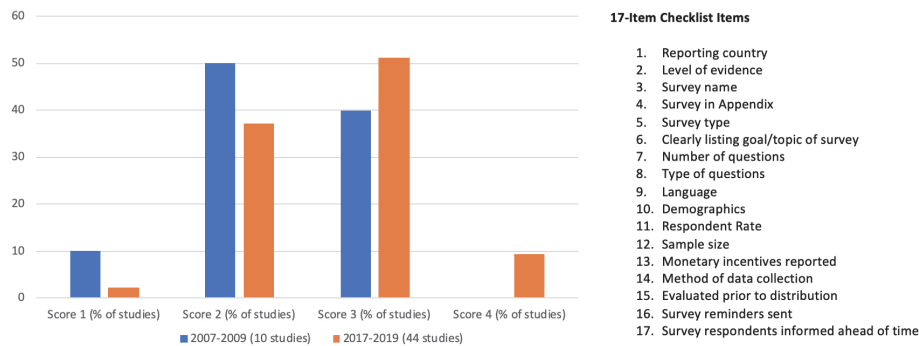
QUALITY ASSESSMENT OF SURVEYS ADMINISTERED TO PEDIATRIC ORTHOPAEDIC SURGEONS

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10.1136/jim-2021-WRMC.174

Purpose of Study Successful physician-administered surveys can advance care and practice quality. There is a lack of research on physician-administered survey quality in pediatric orthopaedics. This study aims to identify essential survey features, evaluate published surveys over two time periods to highlight core strengths and weaknesses, and suggest methods to improve clinical impact.

Methods Used A literature review of MEDLINE and EMBASE databases was conducted for studies published in JPO, JPO B, JBJS, BJJ, JCO, Spine Deformity, or Spine in the years 2007–2009 and 2017–2019. Studies eligible for inclusion contained a survey assessing patients < 18 years administered to pediatric orthopaedic surgeons and had the full text published. Surveys in the literature were studied to compile a list of elements essential to surveys. Two independent reviewers screened titles



Abstract 174 Figure 1 Bar graph showing score category according to how many items were fulfilled or reported from the 17-item checklist with a score of 1 being the lowest and score 4 the highest. Score 1: <25% items, Score 2: 25-50% items, Score 3: 50-75% items, Score 4: >75% items

and abstracts for inclusion, then assessed included studies for quality using a 17-item checklist. Surveys were grouped into scored categories according to how many items were fulfilled (<25%, 25–50%, 50–75%, >75%).

Summary of Results 54 articles were included for analysis. Studies in 2017–2019 fulfilled a greater percentage of checklist items compared to 2007–2009. Mean respondent rate marginally decreased over time (71.2% in 2007–2009 vs 64.1% in 2017–2019). 13 studies had response rates >90%.

Conclusions The use of surgeon-administered surveys in pediatric orthopaedics has substantially increased; however, survey quality has not improved correspondingly. We suggest that surveys aim to report >75% of items (Score 4) from the 17-item checklist to create higher quality, comprehensive surveys. A limitation of our study is the smaller sample of studies included in 2007–2009 vs. the 2017–2019 sample. Future surveys could be improved by following a standardized checklist prior to distribution.

exclusion criteria. 61 articles underwent full-text review. 26 additional studies were identified from references. A total of 14 articles were included in the review. Female medical students were positively influenced by mentorship, specialty exposure, intellectual challenge, and the rewarding nature of surgery. Surgical lifestyle, gender discrimination, and societal and cultural barriers were deterrents for female medical students. Female medical students valued the importance of prestige and expected financial rewards less than their male counterparts.

Conclusions This systematic review identifies mentorship, specialty exposure, gender discrimination, nature of the surgical field, and personal factors to be major determinants in female medical students' decisions to pursue surgery. These areas can be improved to attract more women to surgical residencies. Specific recommendations to increase female students' interest in a surgical career include matching medical students with role models early on, implementing structured outreach programs for women, improving residency parental leave policies, and reducing pregnancy-related stigma.

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FACTORS INFLUENCING FEMALE MEDICAL STUDENTS' DECISIONS TO PURSUE SURGICAL SPECIALTIES: A SYSTEMATIC REVIEW

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10.1136/jim-2021-WRMC.175

Purpose of Study Gender inequality within the medical field continues to be a prominent issue, particularly for surgical specialties. This systematic review evaluates and summarizes the factors that influence female medical students' decision to pursue a career in surgery, including general surgery and surgical subspecialties.

Methods Used A literature search was conducted by two independent researchers searching PubMed, Medline, Embase, Web of Science, and Science Direct databases, in accordance with PRIMSA guidelines. Keywords included 'female,' 'medical students,' 'surgery,' 'gender,' 'career,' 'surgical subspecialty,' 'plastic surgery,' 'ophthalmology,' 'otolaryngology,' 'neurosurgery,' 'orthopedics,' and 'urology.' Studies were identified that evaluated factors influencing female medical students' decision to pursuing surgical specialties.

Summary of Results 2,200 articles were identified in the initial search. 527 duplicates were removed, and 1,993 studies were removed in accordance with pre-identified inclusion and

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ASSOCIATION OF NEURAXIAL ANESTHESIA WITH POSTOPERATIVE OPIOID USE IN PEDIATRIC BURN PATIENTS

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10.1136/jim-2021-WRMC.176

Purpose of Study Pain management is an essential part of recovery among pediatric patients with burn injuries. Studies show that it remains inadequately treated, leading to long-term sequelae of anxiety, depression, and PTSD. However, the use of opioids poses significant risks as well, including opioid dependence later in life. While general anesthesia is the mainstay, studies suggest that regional anesthesia, including neuraxial anesthesia, is one strategy to decrease postoperative pain and reduce opioid use. The purpose of this study is to assess whether neuraxial anesthesia is associated with decreased opioid use among pediatric patients receiving excision and graft repair for burn injuries.

Methods Used A retrospective review of hospital charts from 01/2017 to 06/2018 was conducted. Patients who were hospitalized for split thickness skin grafting and received intraoperative neuraxial anesthesia were included. A study published, which included pediatric burn patients given general

Abstract 176 Table 1 Comparison between groups

| Characteristic | Historic Control (n=30) | Neuraxial Anesthesia (n=42) |
|----------------------|-------------------------------------|-----------------------------|
| Age, months | 32 ± 29.6 (2.2–96) | 61.2 ± 35.7 (12–120) |
| Weight, kg | 13.7 ± 6.4 (3.6–35) | 21.0 ± 8.9 (10.3–41.1) |
| Surgical time, min | 42.1 ± 30.4 (12–94) | 66.0 ± 39.7 (12–242) |
| Morphine, MME/kg/24h | 36.9 ± 10.8 (10.5–126) ¹ | 0.6 ± 0.5 (0–1.9) |

1. Original IV morphine was 13.2 ± 3.6 (3.5–42). An oral MME conversion factor of 3 was used.

anesthesia, served as the control for this study (Bussolin et al). Patients who were >10 years old were excluded from the data analysis in order to match the historical control. The amount of opioids administered postoperatively were converted to oral morphine milligram equivalents (MME) and adjusted for body weight (kg).

Summary of Results In the neuraxial anesthesia group (n=42), the average (range) amount of opioids given was 0.6 (0–1.9) MME/kg/24h. In the general anesthesia group (n=30), the average amount of opioids given was 36.9 (10.5–126) MME/kg/24h (Bussolin et al).

Conclusions Neuraxial anesthesia was associated with lower opioid use compared to general anesthesia from a historical control. However, interpretation of the data is limited as the studies were conducted at different institutions. Further research is warranted to determine the benefit of neuraxial anesthesia and pain management with pediatric burns.

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PAIN ASSESSMENT FOR OFFICE BASED UROLOGIC PROCEDURES

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10.1136/jim-2021-WRMC.177

Purpose of Study The purpose of this review was to characterize how pain and patient discomfort is reported in the literature for office-based urologic procedures. Available data was gathered regarding pain assessment and control and then subsequently evaluated for methodology and management techniques during in-office procedures.

Methods Used Searching PubMed, Embase, Web of Science, CINAHL from inception to 2020, terms and second-layer article collection yielded 948 unduplicated articles. After subsequent screening with exclusion criteria, 134 articles were included investigating urology office-based procedure pain management. Each article was subject to review with the ROBINS-I tool for bias assessment. Data was extracted and included in final analysis.

Summary of Results 134 articles with reference to pain management during five major office based procedures were included. The majority of the articles assessed pain management during prostate biopsy, cystoscopy, urodynamics and other minor procedures. Anesthesia included local, topical, oral, as well as methods of distraction such as music or virtual reality. The most common assessment of pain was the visual analog score (VAS 0–10) pain intensity scoring scale (68%) followed by VAS (0–100) (9%), numerical rating scale (8%), categorical pain rating (3%), other pain scoring methods

(McGill, Spanish Pain, Visual Numeric, 5-point verbal descriptor scales; 4%) or some combination thereof (7%). The majority of studies assessed pain only after the procedure (67%), while the remainder assessed pain at some combination of before, during and after the procedure.

Conclusions This review sought to characterize studies investigating pain management for office-based urologic procedures. Compiling a database of articles yielded a conglomeration of differences with investigating procedural pain. While several themes emerged, such as the type of pain scale and when discomfort was assessed, standardization of pain assessment and management will likely be beneficial for both patients and their urologic care providers.

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A CALL TO BRIDGE THE DIVIDE IN BREAST RECONSTRUCTION RESEARCH: A SYSTEMATIC REVIEW

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10.1136/jim-2021-WRMC.178

Purpose of Study Breast reconstruction requires multidisciplinary clinical-decision making; however, cross-discipline collaborative research is often limited. This study aims to evaluate multidisciplinary involvement in breast reconstruction research.

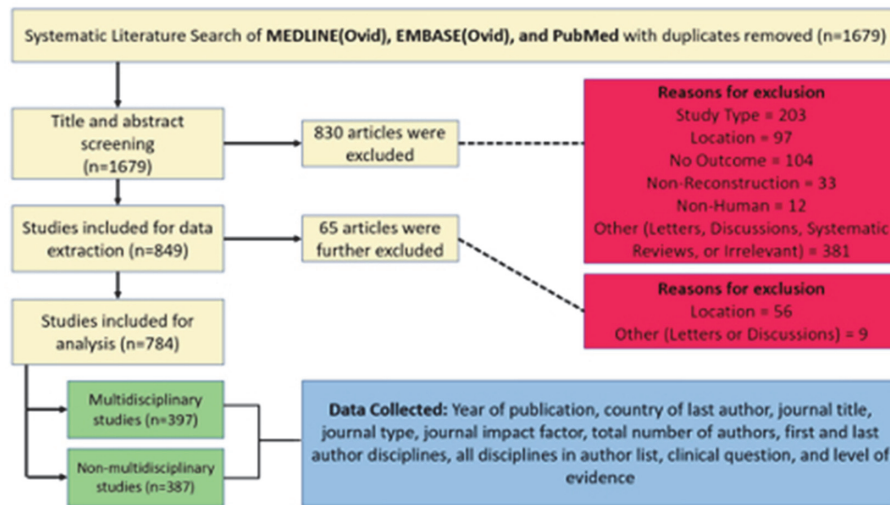
Methods Used A systematic review of breast reconstruction literature published from 2000–2019 using Ovid MEDLINE, Ovid EMBASE, and PubMed was conducted. Authors' affiliations defined multidisciplinary involvement. Quality of research was evaluated using level of evidence and journal impact factor (IF).

Summary of Results Of the 1679 articles screened, 784 met the inclusion criteria. Only half (50.6%) involved an author outside plastic surgery. Compared to non-multidisciplinary studies, multidisciplinary studies were more likely to be of higher level of evidence (I or II) ($p < 0.001$), and published in journals of higher IF ($p < 0.0001$), after adjusting for year of publication, journal type, clinical question, and number of authors.

Conclusions Breast reconstruction outcomes research often fails to offer multi-disciplinary involvement; collaboration is strongly recommended to improve the quality and impact of clinical studies.

Abstract 178 Table 1 Multidisciplinary and non-multidisciplinary breast reconstruction studies by journal type (n=784)

| Journal Type | Non-multidisciplinary studies (n=387) | Multidisciplinary studies (n=397) | p |
|------------------|---------------------------------------|-----------------------------------|----------|
| Plastic Surgery | 343 (89%) | 295 (74%) | 0.06 |
| Oncology | 25 (6%) | 82 (21%) | <0.00001 |
| General Surgery | 6 (1.5%) | 8 (2%) | 0.79 |
| General Medicine | 4 (1%) | 6 (1.5%) | 0.75 |
| Social Sciences | 2 (0.5%) | 4 (1%) | 0.69 |
| Other | 7 (2%) | 2 (0.5%) | 0.17 |



Abstract 178 Figure 1 Preferred reporting items for systematic reviews and meta-analyses (PRISMA) flow chart of the search and screening process with exclusion criteria

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THE IMPACT OF PATIENT, SURGICAL, AND STAFFING FACTORS UPON PERCUTANEOUS NEPHROLITHOTOMY COST

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Purpose of Study In the US, the estimated cost for the management of nephrolithiasis was \$2.07 billion in 2000 and is expected to reach \$4.1 billion by 2030. Percutaneous nephrolithotomy (PCNL) is indicated for the management of kidney stones larger than 2 cm. Awareness of the factors contributing to PCNL case costs could reduce health care spending. The purpose of this study was to determine the factors associated with increasing PCNL cost.

Methods Used A retrospective review of PCNL cases performed at a single institution was conducted between January 2017 and May 2020. For each case, procedural cost and cost of hospital stay were determined. Procedural variables studied included patient age, sex, BMI, ASA, STONE score, surgeon's training (general urologist vs. endourologist), presence of a urology-specific circulating nurse or scrub technician, presence of fellows or residents, operating room time, and whether access was performed by a urologist, radiologist, or both. Multivariate analysis was performed to determine which variables predicted increased cost, with $p < 0.05$ considered significant.

Summary of Results Of the 213 cases, 201 had complete cost data available. In these cases, average procedural cost was \$11,600 and average total cost of hospital stay was \$21,058. Multivariate analysis found OR time increased procedural cost at an average of \$34.50 per minute ($p < 0.0001$, $SD = 2.055$). The presence of a urology-dedicated scrub technician decreased average cost per procedure by \$1585.18 ($p = 0.0002$, $SD = 414.459$). Collaboration between urologist and radiologist in placing access increased cost by an average of \$961.64, compared to access placed unaided by a urologist ($p = 0.04$, $SD = 326.175$).

Conclusions OR time, presence of a urology-dedicated scrub technician, and urologist-obtained access are the primary determinants of PCNL case cost. Institutions should work to

improve efficiency by creating urology specific operative teams to reduce the cost of PCNL.

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RISK FACTORS FOR HYPOSPADIAS REPAIR

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10.1136/jim-2021-WRMC.180

Purpose of Study We aim to review risk factors for postoperative complications in hypospadias repair.

Methods Used We performed a retrospective analysis of 516 boys undergoing hypospadias repair at a single institution between 2004 and 2020. Degree of severity was stratified by native meatus location: distal, mid shaft, or proximal, with proximal hypospadias being considered most severe. Glans width was measured with calipers at the start of surgery. We collected data regarding surgeon, type of hypospadias repair, degree of ventral chordee, and anesthesia block type (caudal block or penile nerve block). Postoperative complications were defined as meatal stenosis, urethral stricture, urethrocutaneous fistula, and glans dehiscence. Descriptive statistics and multivariate analysis were performed using SPSS with $p < 0.05$ being considered statistically significant.

Summary of Results A total of 516 hypospadias surgeries were performed by four surgeons using either tubularized incised plate (376) or meatal advancement and glanuloplasty (140). Median age at surgery was 10.1 months [7.37 – 18.45]. Mean follow-up time was 7.8 months. The severity of hypospadias was distal in 83.7% of cases, midshaft in 7.9%, and proximal in 8.3%. The overall complication rate was 8.3%. The complication rate for distal hypospadias was 4.9%, versus 12.2% for midshaft and 39.5% for proximal. Hypospadias location and glans width were significant predicting factors for postoperative complication ($p < 0.001$, CI 95% [1.50, 3.67]), ($p = 0.002$, CI 95% [0.61, 0.90]) respectively. Surgeon, type of hypospadias repair, degree of ventral chordee, and anesthesia block type were not found to be statistically significant on multivariate analysis.

Conclusions Severity of hypospadias and smaller glans size are predictive for post-operative complications. Predictive risk factors can help guide discussion during preoperative counseling.

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A RETROSPECTIVE STUDY OF RISK FACTORS AND OUTCOMES IN THE SURGICAL MANAGEMENT OF SLIPPED CAPITAL FEMORAL EPIPHYSIS

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Purpose of Study Slipped Capital Femoral Epiphysis (SCFE) is conventionally treated with in-situ pinning (ISP) and more recently, the Modified Dunn Procedure (MDP). This study retrospectively examines the pre-operative risk factors and post-operative complications of patients treated with either ISP or MDP in a 12 year period.

Methods Used A single-centre, retrospective review was performed on patients diagnosed with and surgically treated for SCFE from 2004 to 2016. Patients must have had pre-operative imaging and a minimum of six months of clinical follow-up. Pre-operative demographic data (age, gender, intensity of symptoms, stability, trauma, and severity of slip), operative details, and treatment outcomes were collected. Descriptive statistics were used to identify pertinent pre-operative risk factors and post-operative complications in each treatment group.

Summary of Results A total of 129 hips in 98 patients were treated (118 with ISP, 11 with MDP). Complications developed in 12 hips (12 patients); six hips developed AVN, two developed AVN and chondrolysis, two developed AVN and slip progression, and two developed slip progression only. In hips treated with MDP, 4/11 (36.4%) developed complications; while 8/118 (6.8%) hips treated with ISP developed complications.

Conclusions Complications developed in 9.3% of hips treated with ISP or MDP, with a higher rate of complications observed in the MDP group compared to the ISP group. The study is limited by the small sample size of the cohort and the disproportionate number of cases in each treatment group. A multi-centre study with larger sample sizes will be required to confirm these findings.

Gastroenterology

Concurrent session

4:20 PM

Friday, January 29, 2021

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CLINICAL ASSOCIATIONS WITH MYELOID-DERIVED SUPPRESSOR CELL (MDSC) LEVELS IN HEPATOCELLULAR CARCINOMA (HCC) PATIENTS

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Purpose of Study MDSC are immature myeloid cells with immunosuppressive capabilities. Elevated MDSC levels have been described in HCC and are associated with greater tumor burden and poorer response to treatment and survival. In this analysis, we sought to refine clinical associations with elevated MDSC levels to identify potential clinical utility for this biomarker.

Methods Used Between June 2016 and September 2018, 46 HCC patients were tested for MDSC levels using a clinically validated whole blood flow cytometric assay (Apodaca et al, JITC (2019) 7:230). Total MDSC (T-MDSC) were defined as CD45+CD3⁻CD19⁻CD20⁻CD56⁻CD16⁻HLA-DR⁺CD33⁺CD11b⁺ cells/ μ L. All clinical data, with the exception of death, transplant and treatment variables, were obtained within 30 days of the MDSC test date.

Summary of Results T-MDSC levels ranged from 14–617 cells/ μ L. Patients were divided into high (N=20) or normal (N=26) T-MDSC groups based on a single whole blood measurement.

The high T-MDSC group had higher total bilirubin (1.33 ± 0.88 vs 0.9 ± 0.44 mg/dL, $p=0.04$), lower serum albumin (3.46 ± 0.48 vs 3.83 ± 0.46 g/dL, $p=0.01$), higher WBC count (7.02 ± 1.76 vs $5.35 \pm 1.42 \times 10^3/\mu$ L, $p=0.001$), and more ascites ($p=0.04$) compared to the normal group. High T-MDSC patients were more likely to be categorized as Child-Turcotte-Pugh (CTP) class B or C (vs A) ($p = 0.0004$) and Barcelona Clinic Liver Cancer (BCLC) stage C or D (vs A or B) ($p=0.03$) than the normal patients. Elevated T-MDSC levels were not associated with tumor size or number, vascular invasion, or AFP level. Although the high T-MDSC group experienced more deaths (12/20) than the normal group (10/26), the difference was not significant ($p=0.15$). Using Cox Proportional Hazard analysis, T-MDSC levels were not associated with patient survival before (hazard ratio 1.90, 95% CI 0.80–4.47) or after adjusting for age, CTP class, ECOG performance status and BCLC stage (hazard ratio 0.47, 95% CI 0.10–2.21).

Conclusions Elevated MDSC levels were associated with more advanced disease and liver cancer stage but not with tumor characteristics or death. Additional studies are needed to investigate the relationship between MDSC levels and advanced cirrhosis.

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THE ROLE OF GUT MICROBIOTA AND DIET IN HEALTH OUTCOME OF COVID-19 PATIENTS WITH COMORBIDITIES

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Purpose of Study COVID-19, caused by the SARS-CoV-2 virus, is a novel infectious disease that has led to a global pandemic. SARS-CoV-2 gains cellular entry via ACE2 receptors which are localized to the lungs and gut, contributing to the respiratory and gastrointestinal symptoms in patients with COVID-19. Comorbidities such as obesity, diabetes, as well as advanced age represent high risk factors that have led to more severe symptoms and fatalities in COVID-19 patients. Obese, diabetic, and elderly patients have been characterized by a compromised immune system, overall systemic inflammation, disruptions in the gut microbiota composition profile (i.

e. gut dysbiosis), poor nutritional status and nutrient deficiencies. The purpose of this paper is to discuss how these factors may contribute to the clinical manifestation of COVID-19 patients and how diet through specific nutrients and bioactive compounds can be used to restore and maintain proper immune cell function, increase protection against chronic inflammation, restore gut dysbiosis and improve health outcomes.

Methods Used We searched manuscripts from the emergence of the pandemic from Dec. 2019 to Aug. 2020 as they relate to COVID-19's impact on the gut, immune system, diet, and comorbidities. We related these observations with past articles conducted on these subjects.

Summary of Results The gut microbiome has been shown to contribute to the host's immune system development in addition to helping balance inflammatory responses. Dysbiosis of the microbiome has been associated with severe symptoms of COVID-19 through the gut lung axis by increasing systemic inflammation. Improper diet can also contribute to increased inflammatory signaling, which is the hallmark condition in COVID-19. There is a direct relationship between COVID-19 severity and inflammatory cytokines through the production of the cytokine storm. Diabetic, obese, and elderly patients have impaired gut microbiomes and nutritional deficiencies that may contribute to their vulnerability to COVID-19.

Conclusions Proper diet and nutritional supplementation have shown to both improve gut microbiota composition profile and reduce systemic inflammatory effects. This could have a beneficiary role in these immuno-compromised at risk populations during the COVID-19 pandemic.

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SYSTEMATIC REVIEW OF RESIDENT DISCREPANCIES IN EMERGENCY ABDOMINAL RADIOLOGY

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10.1136/jim-2021-WRMC.184

Purpose of Study Radiology call is a challenging endeavor for radiology residents. Although general diagnostic error rates are overall low,¹ having a resident on call and an emergent setting like the emergency department can increase the frequency of mistakes. These diagnostic imaging errors are typically multifactorial and can be classified by body location and etiology of the mistake.²⁻³ Errors in interpretation of diagnostic imaging can lead to delays in patient care, patient morbidity or mortality, and increased cost of care. This study analyzed primary discrepant cases in abdominal imaging to elucidate patterns of error location and type in order to inform pre-call resident education.

Methods Used Resident discrepancies for abdominal imaging in the emergency setting at a level 1 trauma academic medical center between 2015–2020 were reviewed. Discrepant cases were classified by error type, body part involved, and diagnosis. Descriptive analysis was performed.

Summary of Results A total of 197 studies had resident discrepancies, and several of these studies had more than one discrepant finding. When classified by error types, 61.4% stemmed from satisfaction of search, 34.0% from inadequate search pattern, and 8.6% from inadequate assessment of

peripheral locations. When classified by body parts missed, 47.7% involved solid organs, 22.8% involved hollow visci, and 16.8% involved musculoskeletal structures.

Conclusions Most resident call interpretation errors in abdominal imaging were attributable to satisfaction of search or inadequate search patterns. Nearly half of all errors involved solid organ structures, and the most commonly misdiagnosed entities involved the lymph nodes, pancreas, appendix, and kidneys. By shedding light on error patterns, we hope to improve resident education prior to call to reduce diagnostic errors.

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CHARACTERIZING THE MORPHOLOGIC SPECTRUM OF DIVERTICULOSIS AND ASSOCIATING RISK OF DEVELOPING DIVERTICULITIS

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Purpose of Study Diverticula are the most common finding on colonoscopy; about 4% of these patients will develop diverticulitis. Diverticular morphology in the colon varies greatly in both size and distribution; this variability has not yet been systematically quantified or studied in relationship to diverticulitis. The primary goal of this study was to characterize and categorize the morphologic spectrum of diverticulosis diagnosed on colonoscopy and study the association between morphology and risk of diverticulitis.

Methods Used We performed a retrospective, case-control study of 85 patients with a history of diverticulitis and 85 controls with diverticulosis without diverticulitis matched on gender, age (within 5 years) and year of colonoscopy, identified using a search of the electronic medical record. The variables for morphologic characteristics were obtained from review of electronically available endoscopy reports and included extent, number and size of diverticula. We also assessed characteristics of diverticulitis in cases including the presence of complications. Baseline characteristics were compared in cases and controls using the McNemar Chi-Square test and odds ratios and 95% confidence intervals were calculated for diverticulosis severity, location, and size.

Summary of Results Baseline characteristics in diverticulitis cases and controls were similar except that cases were more likely to have a diagnosis of IBS ($P=0.043$) than controls. Among the cases with a history of diverticulitis, 69% of diverticulitis was located in the sigmoid colon and 27% had complicated diverticulitis. Cases were more likely to have severe diverticulosis on endoscopy compared to controls ($OR=4.09$, 95% $CI=1.85-9.07$), less likely to have mild diverticulosis ($OR=0.22$, 95% $CI=0.11-0.42$), less likely to have diverticulosis present only in their right colon ($OR=0.11$, 95% $CI=0.02-0.51$), and less likely to have small diverticula present ($OR=0.35$, 95% $CI=0.16-0.76$).

Conclusions In our study, cases with a history of diverticulitis were more likely to have severe diverticulosis on colonoscopy and less likely to have small diverticula and diverticula located only in the right colon when compared to controls. Diverticular morphology is a novel risk factor for diverticulitis.

186 CONGENITAL NARROWING OF CBD AND PANCREATIC DUCT CAUSING PANCREATITIS IN OTHERWISE HEALTHY 18 Y/O FEMALE

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10.1136/jim-2021-WRMC.186

Purpose of Study To share this interesting case with the medical community

Methods Used Retrospective study

Summary of Results An 18-year-old Hispanic female with no significant past medical history presented with sharp epigastric abdominal pain for four days with radiation to right upper quadrant. The pain was associated with nausea and five episodes of yellow bilious vomiting over the past 24 hours. The patient denied consuming alcohol or illegal drug abuse. She also denied using any new medication or herbal treatment and history of trauma. Patient had cholecystectomy at the age of 9. When asked about the detail's patient stated she had to wait for few days for her pancreas level to come down before cholecystectomy. On physical examination, she was afebrile, had blood pressure of 124/77 mm Hg, and heart rate of 68 beats/min with respiratory rate of 18.

Her laboratory tests on admission revealed a WBC of $20.1 \times 10^3/\mu\text{L}$ with neutrophil of 87.7%. She had unremarkable basic metabolic panel. The urine HCG was negative, but urine toxicology was positive for cannabinoids. Her serum lipase was 13,121. The CT scan showed pancreas with peripancreatic fat stranding and trace amount of peripancreatic fluid consistent with pancreatitis. Patient was admitted to the floor and kept NPO. She was treated with intravenous fluids, analgesics and antibiotics. The following day patient had MRCP done showing narrowing of the pancreatic duct worse in common bile duct. Patient's abdominal pain resolved, tolerated clear liquids and subsequently advanced to full liquids then GI soft diet. Patient was discharged with outpatient follow up with gastroenterology and IM clinic. The autoimmune labs were positive for ANA with titer of 1:40, CA 19-9 of 37 units/mL, smooth muscle ab titer of 1:20 and negative for IgG4 of 37.9.

Conclusions Patient presented with the typical case of acute pancreatitis and was subsequently managed with conservative treatment. But due to the patient being 18 years of age an underlying etiology was suspected. The MRCP showing narrowing of the pancreatic duct. The patient got better over the course of two days so there was no indication for ERCP. Also, autoimmune etiology was suspected as narrowing of the pancreatic duct is associated with underlying autoimmune pancreatitis.

187 DIGITAL CLUBBING AND EOSINOPHILIC ESOPHAGITIS

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10.1136/jim-2021-WRMC.187

Background Digital clubbing is regarded as one of the most ancient clinical signs in medicine, characterized by an increase in nail plate convexity, resulting in excessive sponginess of the nail base. Digital clubbing is associated with a variety of diseases, including infections, inflammatory disease, cardiopulmonary and gastrointestinal disorders. Previously there have been

no reported cases of digital clubbing in association with eosinophilic esophagitis (EoE).

Case A 17-year-old male initially presented with a 3-year history of joint pain, myalgia, digital clubbing, chronic chest tightness, difficulty sleeping, chronic vague abdominal pain, loose stools and difficulty swallowing medications. In addition he had stiffness of his hands, knees and shoulders and intermittent swelling of his knees. His initial evaluation showed normal vital signs. His physical exam was unremarkable except for moderate digital clubbing.

An evaluation for endocrine, rheumatologic, pulmonary and cardiac processes showed normal laboratory values. His chest computer tomography scan, sweat chloride test and echocardiogram were also normal. An esophagogastroduodenoscopy (EGD) showed increased intraepithelial eosinophils at 25 eosinophils per high-powered field (HPF) on mid-esophageal biopsy consistent with EoE. His bronchoscopy showed laryngeal and airway inflammation and tracheobronchomalacia. Evaluation for primary ciliary dyskinesia revealed normal ultrastructure and two variants of unknown significance on genetic testing. He was started on omeprazole and eventually oral budesonide with improved gastrointestinal, sleep, and respiratory symptoms and his digital clubbing reduced in severity.

Discussion This is a rare presentation of digital clubbing with EoE. Treatment of his EoE led to improved symptoms as well as digital clubbing on examination. The correlation between digital clubbing and EoE in this case remains unclear. Previous research shows some similarities between the two diseases in angiogenesis based on biomarkers. Given the lack of reports of patients with EoE and clubbing this raises the potential that his EoE may be causing respiratory disease such as aspiration or sleep apnea, though it also raises the question whether this relationship is being under-reported in general.

188 BLINDNESS IN A HEALTHY CHILD

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10.1136/jim-2021-WRMC.188

Case Report Our patient is an 8 year-old previously healthy male with many months of red eyes, irritation, photophobia, and red bumps on eyelids with discharge who presented to the emergency department with acutely worsening symptoms. He was initially diagnosed with styes and discharged home with instructions for warm compresses. He followed up with primary pediatrician who recommended antibiotic ophthalmic drops. This was ineffective and he was eventually referred to two ophthalmologists who both prescribed steroid eye drops. He was not given a formal diagnosis, according to mother. He returned to our emergency department with worsening eye symptoms, new onset night blindness, and was found to have bilateral eye cloudiness and right corneal abrasion on exam. A comprehensive history revealed poor diet consisting primarily of fast food. He was admitted for evaluation of vitamin A deficiency versus infectious cause. Eye exam under anesthesia revealed bilateral conjunctival xerosis with right-sided Bitot's spots, stromal loss, and bilateral deep interstitial keratitis. Vitamin A level returned critically low at $<2.5 \mu\text{g}/\text{dL}$. Infectious workup was negative. 50K units of vitamin A supplementation daily was started. On subsequent follow up

visits patient reported improved photophobia, eye edema, and pain, but visual acuity was slower to recover.

In the developing world vitamin A deficiency is usually caused by food deprivation and is a major cause of preventable blindness worldwide. In high-income countries, where vitamin enriched foods are more readily available, vitamin A deficiency is rare and primarily related to underlying medical conditions (i.e. malabsorption) or restrictive eating habits. However, it is also possible that this condition is underdiagnosed because of nonspecific early symptoms, which could have been the case for our patient. Furthermore, there was also question if our patient had an undiagnosed behavioral condition such as autism that would cause picky eating. It is well documented that children with autism and very rigid behaviors can suffer from significant malnutrition, which can result in severe vitamin deficiencies. This case further highlights the importance of thorough history taking, including diet, eating habits and behavioral habits, when patients present with nonspecific complaints.

Surgery III

Concurrent session

4:20 PM

Friday, January 29, 2021

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AN EVALUATION OF THE IMPACT OF 0.05% CHLORHEXIDINE ON THE PREVALENCE OF SURGICAL SITE INFECTIONS IN AESTHETIC BREAST SURGERY

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10.1136/jim-2021-WRMC.189

Purpose of Study Surgical site infections (SSI) burden U.S. hospitals with around \$1.5 billion annually. To reduce SSI, irrigating the incision with an antimicrobial solution before closure is recommended. Hence, we evaluate the impact of Irrisept, a form of diluted chlorhexidine 0.05%, on reducing the prevalence of SSI in a high-risk breast cosmetic surgery population.

Methods Used We conducted a retrospective cohort study using data in the electronic medical record for breast implant exchange patients in one practice and analyzed infection rates between 42 patients from July 2018-June 2019 that did not

receive Irrisept irrigation (control group) with 16 patients from July 2019-July2020 that received Irrisept irrigation (experimental group; significantly less due to Covid-19). We executed descriptive analyses, independent T test, ANOVA (for 3 types of incision location), and Chi-squared to assess comorbidities and intraoperative factors.

Summary of Results Among the control group (n=42), 4 patients had a postoperative infection; in the experimental group (n=16), 0 had an infection (9.52% vs. 0%; p=0.04) suggesting the use of Irrisept significantly decreases SSI. The p values from the T test and ANOVA (p<0.05=significant) showed no significant differences in breast cancer (0.84), previous radiation (0.32), history of chemotherapy (0.57), obesity (0.40), renal failure (0.32), smoker/previous smoker (0.41), type of implant (0.32), incision location (0.68), acellular dermal matrix use (0.32), or drain use (0.58) between two groups. The only significant comorbidity was diabetes (p=0.04) with 9.52% (control) vs. 0% (experimental). However, greater percentage of experimental group were obese (25% vs.14.29%) and had a history of smoking (25% vs. 9.52%).

Conclusions A concern regarding the implementation of Irrisept irrigation is associated costs. However, the results show the use of Irrisept decreases the infection rates, ultimately relieving the financial burden of postoperative infections. Therefore, we recommend irrigating the incisions of breast surgery patients with Irrisept as both a preventative and economic measure.

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INTRAOPERATIVE MANEUVERS TO OPTIMIZE THE HEALING OF SURGICAL INCISIONS: AN EVIDENCE-BASED REVIEW

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10.1136/jim-2021-WRMC.190

Purpose of Study Incisions vary in intricacy as procedures advance to meet the increasingly complex physiology of the patient pathology. Optimizing the healing of incisions is paramount in the care of surgical patients. Many different interventions are used with the aim to reduce the risk of surgical site infections (SSI) and enhance wound care after surgery. This review presents a compilation of evidence-based, safe, and effective intraoperative interventions for most populations undergoing surgery.

Abstract 190 Table 1 Intraoperative Maneuvers to Optimize Surgical Incision Healing

1. Patients should be screened for a history of MRSA, and MRSA-positive patients should apply Mupirocin intranasally twice daily and bathe in Chlorhexidine gluconate (CHG) daily for 5 days immediately before the operation. A single dose of vancomycin should be administered to MRSA carriers 120 minutes before procedure. For all patients, regardless of the MRSA screening results, cefazolin or cefuroxime should be given as prophylaxis 60 minutes prior to surgical incision, redosing for procedures 4 hours or longer.
2. Maintaining normothermia, glycemic control, and enhancing oxygenation throughout the procedure should be prioritized.
3. Chlorhexidine with or without isopropyl alcohol and careful debridement of all non-viable tissue achieves enhanced antisepsis and reduces incisional healing challenges.
4. Using diluted chlorhexidine 0.05% for irrigating the wound before closing any layer of incision, antimicrobial sutures when closing, and negative pressure wound therapy (NPWT) over high-risk incisions are useful in reducing postoperative wound complications.
5. Staff should wash hands using 60–80% ethanol and double glove with an indicator system, changing the outer glove every hour. OR traffic should be limited.
6. Primarily closed incisions should be covered with sterile dressing for 24–48 hours postoperatively. If dressing must be changed prior to 48 hours, use the sterile technique. Dressings may be selected in the context of managing wound exudate, patient experience, wound location, and/or patient risk factors.

Methods Used A broad literature review was performed to identify publications on optimizing the healing of surgical incisions with an emphasis on intraoperative maneuvers. Key words and phrases that were used to search the literature include: *SSI control AND prevention, intraoperative maneuvers AND SSI, surgical incision healing, SSI bundles AND effective interventions, adoption of incision healing methods, epidemiology of SSI, and intraoperative measures*. Out of all the searches, 34 articles were selected to develop an evidence-based compilation of the safest and most effective interventions.

Summary of Results A summary of the interventions is presented in table 1.

Conclusions Evidence suggests that the effective interventions presented optimize surgical incision healing; however, compliance and implementation of these maneuvers remain a challenge. Knowledge of the risks to incision healing and the benefit of various post-operative incisional dressings guide providers' decision making.

191 DOES THE NOVEL THULIUM LASER GENERATE MORE HEAT THAN THE CONVENTIONAL HOLMIUM LASER?

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10.1136/jim-2021-WRMC.191

Purpose of Study The novel thulium fiber laser (TFL) has been shown to break stones more rapidly than the traditional Ho:YAG laser. However, evidence suggests that the TFL may result in more thermal injury. The purpose of this study is to compare ureteral temperatures during flexible ureteroscopic laser lithotripsy.

Methods Used A 1-cm Bego Stone was manually impacted 3 cm from the ureteropelvic junction in a 3D printed Dragon Skin kidney-ureter stone-patient replica submerged in 35°C saline. Lithotripsy was performed using a 7.6 French flexible ureteroscope and a 200 m laser fiber without a ureteral access sheath, comparing 3 lasers (Dornier 30W, Olympus Empower

Abstract 191 Table 1 Average Ureteral Temperatures for Dornier, Empower, and Thulium lasers

| Laser Settings | Average Ureteral Temperature (°C) | p Value |
|----------------|-----------------------------------|---------|
| 3.6W | 24.57 ± 0.26 (Dornier) | 0.000 |
| | 23.23 ± 0.26 (Empower) | |
| | 26.36 ± 1.08 (Thulium) | |
| 6.4W | 27.73 ± 1.08 (Dornier) | 0.019 |
| | 26.09 ± 0.45 (Empower) | |
| | 26.61 ± 0.39 (Thulium) | |
| 10W | 28.28 ± 1.00 (Dornier) | 0.114 |
| | 27.20 ± 0.52 (Empower) | |
| | 27.87 ± 1.15 (Thulium) | |
| 20W | 32.42 ± 1.96 (Dornier) | 0.114 |
| | 33.38 ± 4.29 (Empower) | |
| | 36.44 ± 2.76 (Thulium) | |
| 30W | N/A (Dornier) | 0.028 |
| | 37.28 ± 4.84 (Empower) | |
| | 41.76 ± 1.38 (Thulium) | |

100W, and Olympus Thulium 60W). The laser tip was positioned on the stone, 2 mm from the needle thermocouple. Irrigation was maintained at 35cc/min and $23.8 \pm 1.5^\circ\text{C}$. Ureteral temperature was continuously recorded for 60 seconds of laser activation. 5 trials were performed for each of 5 different power settings: 3.6, 6.4, 10, 20, and 30 Watts. ANOVA and Mann-Whitney U tests were performed, with $p < 0.05$ considered significant.

Summary of Results Table 1 shows the average temperature for each laser at each setting. The TFL produced significantly higher temperatures at 3.6W and 30W settings.

Conclusions The TFL generates more heat at both 3.6W and 30W settings. Supraphysiologic ureteral temperature generated by this laser could cause ureteral injury with extended use at high energy settings and low irrigation rates. Understanding the heat generation properties of the TFL is important to maintain safety during ureteroscopic laser lithotripsy.

192 COMPARISON OF THULIUM FIBER LASER CORE DIAMETERS IN TREATING IN SITU LOWER POLE NEPHROLITHIASIS

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10.1136/jim-2021-WRMC.192

Purpose of Study Recent studies have found the thulium fiber laser (TFL) to be a positive alternative to the conventional holmium: YAG (Ho:YAG) laser for intracorporeal lithotripsy. One advantage of the TFL is its ability to support higher frequency settings with smaller diameter fibers that allow for better deflection, irrigation and visibility; however, this must be weighed against its efficacy in stone treatment. The purpose of this study was to test this by comparing the TFL against a conventional Ho:YAG laser in the treatment of in situ lower pole kidney stones.

Abstract 192 Table 1 TFL vs. Ho:YAG Results

| Laser Fiber Type | Laser Settings | Procedure Time (s)* | Sig. | Maximum Deflection (degree) | Ease of Deflection | Visibility |
|------------------|----------------------|---------------------|--------|-----------------------------|--------------------|------------|
| TFL 150um | 20hz x 1J (20W) | 1599.0 (221.0) | 0.008† | 254.6 ± 2.7 | 5/5 | 5/5 |
| | | 1491.0 (206.0) | 0.008 | | | |
| | 50hz x 0.4J (20W) | 1096.0 (215.0) | | | | |
| | | 2099.0 (499.0) | 0.009‡ | 240.9 ± 3.4 | | |
| TFL 200um | 20hz x 1J (20W) | 2099.0 (499.0) | 0.009‡ | 216.8 ± 2.2 | 2/5 | 4/5 |
| | | 1939.0 (464.0) | 0.009 | | | |
| | | 1399.0 (330.0) | | | | |
| Ho:YAG 200um | 15hz x 0.6J (9W) | 2245.0 (1324.0) | | | | |

*Median values are shown with the range in parenthesis † Comparison of TFL 150 um trails versus Ho:YAG trials ‡ Comparison between TFL 150 um versus TFL 200 um trials

Methods Used A benchtop study was conducted using a 3D printed kidney model. 1.0 cm BegoStone phantom stones of calcium oxalate monohydrate consistency were placed in the lower pole calyx. A 60W Olympus Soltive TFL was trialed with both a 150 mm and 200 mm fiber at 1J x 20Hz (20W), 0.4J x 50Hz (20W) and 0.2J x 100Hz (20W). A 30W Dornier Medilas Ho:YAG was trialed using a 200 mm fiber at 0.6J x 15Hz (9W). Stones were treated by the same urologist using a flexible ureteroscope with the stone free endpoint of <2 mm and several parameters were recorded. Mann – Whitney U test was done for analysis with $p < 0.05$ considered significant.

Summary of Results Procedure time was significantly lower in the TFL trials with a 150 mm fiber at all settings when compared to the TFL trails with a 200 mm fiber and the Ho:YAG trials (table 1).

Conclusions Stones treated by TFL with a small fiber diameter required less procedure time with better scope deflection and visibility. Additional *in vivo* trials are needed but these findings suggest that there are significant advantages in treating lower pole stones with TFL.

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RETROSPECTIVE COHORT ASSESSMENT OF PROKINETIC PROPERTIES OF AZITHROMYCIN ON POSTOPERATIVE ILEUS

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10.1136/jim-2021-WRMC.193

Purpose of Study Postoperative ileus has been reported in 10 to 20% of cesarean patients. Macrolides are traditionally used as antibiotics, but they also have promotility properties. Previous studies failed to show beneficial effect of erythromycin on ileus but azithromycin has not been thoroughly investigated. This study evaluates the utility of azithromycin to reduce postoperative ileus.

Methods Used A retrospective cohort analysis of 3993 patients undergoing cesarean section were divided into two groups based on pre-operative azithromycin (n=2632) or no azithromycin administration (n=1361). Patients were selected from medical record database search who were cesarean patients from June 2015 to September 2019. Primary outcome was patients with post-operative bowel movement (BM) within 24 hrs of azithromycin administration. We also analyzed flatus, and postoperative nausea and vomiting (PONV) within 24 hours of azithromycin, post-operative length of stay (LOS), time to diet, and discharge disposition.

Summary of Results Age, race, gravidity, parity, and ASA classification were all clinically comparable between both groups. (Table 1) BM within 24 hours was seen in 37% of the patients with azithromycin compared to 14% of patients without azithromycin ($P < 0.00001$). Flatus within 24 hours was seen in 3.9% of patients with azithromycin compared to 2.0% with no azithromycin ($P = 0.00135$). Post-operative LOS was shorter with the patients with azithromycin at 76 ± 18 h compared to no azithromycin group at 79 ± 14 h ($P = 0.00005$). (Table 2).

Conclusions The shorter time to BM, flatus and post-operative LOS is likely attributed to decreased ileus in patients administered azithromycin. This study shows that azithromycin

Abstract 193 Table 1 Cesarean patient selection characteristics

| | Azithromycin (n=2632) | No Azithromycin (n=1361) | p-value |
|--------------------------------|--------------------------|--------------------------------|-------------------------|
| Age: median (IQR) | 31 (27–35) | 30 (26–34) | 0.002222 (t-test) |
| Race: n (percent) | - | - | 0.00229448 (Chi-sq) |
| American Indian | 37 (1.41%) | 22 (1.62%) | |
| Asian | 153 (5.81%) | 80 (5.88%) | |
| Black | 337 (12.80%) | 150 (11.02%) | |
| Hispanic | 43 (1.63%) | 21 (1.54%) | |
| Pacific Islander | 3 (0.11%) | 10 (0.73%) | |
| White | 1975 | 1011 (74.28%) | |
| Other/Unknown/Refused | 84 (3.20%) | 67 (4.92%) | |
| Duration of Surgery (mins): | 62 (50–76) | 62 (51–76) | 0.422834 (Mann-Whitney) |
| Median (IQR) | - | - | |
| Anesthetic: n (percent) | - | - | 0.09273586 (Chi-sq) |
| Spinal | 1816 (69.00%) | 918 (67.45) 304(22.34%) | |
| Epidural | 521 (19.79%) | 139 (10.21%) | |
| General | 295 (11.21%) | | |

Abstract 193 Table 2 Cesarean patient significant outcomes

| | Azithromycin (n=2632) | No Azithromycin (n=1361) | p-value |
|--------------------|--------------------------|-----------------------------|--------------------------------|
| BM within 24 hrs | 963 (36.59%) | 187 (13.73%) | |
| Yes | | | |
| Flatus in 24 hrs | 102 (3.88%) | 27 (1.98%) | 0.001354 (Chi-sq) |
| Yes | | | |
| Post-op LOS (hrs): | 76 (59–96) | 79 (66–96) | 0.0000485673 (Mann-Whitney) |
| Median (IQR) | | | |

deserves future prospective investigation as an agent to reduce post-operative ileus.

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IMPACT OF MONTGOMERY T-TUBES ON TREATMENT OF LARYNGOTRACHEAL STENOSIS AND VOICE OUTCOMES

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10.1136/jim-2021-WRMC.194

Purpose of Study Placement of a Montgomery T-tube is indicated for patients as a stent to maintain airway patency in those presenting with laryngotracheal stenosis with intention to also treat secondary aphonic or dysphonic symptoms. The objective of this paper is to identify the indications, complications, and airway and voice outcomes of patients that were managed with Montgomery T-tube stenting.

Methods Used A retrospective chart review was done on patients treated with Montgomery T-tubes for laryngotracheal stenosis due to either iatrogenic causes or other etiologies. Patient demographics including age, gender, and BMI were analyzed along with their indication for t-tube placement,

duration of t-tube placement, and numbers of surgeries related to their t-tube placement. Treatment outcomes were also recorded, including Voice Handicap Index, VHI-10 scores before and after t-tube placement, complications, and time since the definitive procedure.

Summary of Results 13 patients were included (4M9F), of which nearly half of were aphonic prior to tube placement. The most common indication for t-tube placement was management of secondary subglottic and tracheal stenosis. Other indications included treatment of fractured cricoid ring, post arytenoidectomy defects, preference of t-tube over trach tube, and post-laryngotracheal resection with reanastomosis. The data presented statistically significant improvements in VHI-10 scores after t-tube placement ($p < 0.05$). Eight patients were successfully decannulated, four patients are still being treated, and one was lost to follow-up. The most common complication related to t-tube placement was the accumulation of granulation tissue, with all patients having to undergo granulation excisions. There were no deaths related to t-tube placement.

Conclusions Treatment with Montgomery T-tubes can show improvement in voice quality in patients with severe dysphonia secondary to laryngotracheal stenosis and traditional tracheostomies. However, the complication rate and contraindications should be taken into consideration. More research regarding the methods of placement, treatment course and care are necessary to understand the role of t-tubes in treating laryngotracheal stenosis.

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SURGICAL DEBRIDEMENT FREQUENCY DURING USE OF NEGATIVE PRESSURE WOUND THERAPY WITH INSTILLATION VERSUS CONTROL: A SYSTEMATIC REVIEW AND META-ANALYSIS

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10.1136/jim-2021-WRMC.195

Purpose of Study Meta-analyses have become increasingly important in health care decision making. Currently, there are no published meta-analyses comparing outcomes with the use of negative pressure wound therapy (NPWT) with instillation and dwelling of a topical solution (NPWTi-d) versus alternative wound care strategies. To address this gap, a systematic review and meta-analysis were performed to report the integrated results of studies describing use of NPWTi-d versus any other wound care strategy (ie, control) in any wound type.

Methods Used 720 patients across thirteen studies were included in the analysis. Weighted standardized mean difference or odds ratios as well as 95% confidence intervals were calculated in order to pool study and control group results in each publication for analysis.

Summary of Results Results showed wounds in the NPWTi-d group received significantly fewer surgical debridements and were prepared faster for surgical closure versus the control group (2.23 v. 3.07, $p = 0.01$ and 3.02 days v. 4.16 days, $p = 0.03$, respectively). The odds of reducing bacterial count from baseline in the NPWTi-d group was 4.4 times greater than control group wounds ($p = 0.003$), and percent reduction of bacterial count in NPWTi-d wounds was evident in all

studies that included that endpoint. Wounds in NPWTi-d group had successful closure 2.39 times more than control group wounds ($p = 0.01$). There was a significantly shorter length of therapy with NPWTi-d versus control wound care strategies ($p = 0.03$). Length of hospital stay was not significantly reduced for NPWTi-d patients compared to control patients ($p = 0.06$).

Conclusions These meta-analysis results show a positive overall effect of NPWTi-d on various wound types in comparison with other wound care strategies.

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INITIAL EXPERIENCE WITH CLOSED INCISION NEGATIVE PRESSURE THERAPY SPECIALTY DRESSING OVER STERNAL RECONSTRUCTION INCISIONS

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10.1136/jim-2021-WRMC.196

Purpose of Study Following median sternotomy, surgical site complications (SSCs) such as sternal dehiscence have an incidence of 0.06% to 12.50%, with associated perioperative mortality as high as 47%. Closed incision negative pressure therapy (ciNPT) administers continuous subatmospheric pressure, removes fluid and infectious materials, holds incision edges together, provides a barrier to contaminants and reduces the incidence of edema. Recently, a ciNPT specialty dressing with an expanded coverage area was developed to protect incisions. We describe our experience using this ciNPT specialty dressing to help manage sternal reconstruction incisions in 4 patients.

Methods Used The ciNPT specialty dressing was applied to incisions stemming from revised sternal dehiscences of patients ($n = 4$) who had developed SSCs following index cardiothoracic procedures. Perioperative antibiotics were administered. A single surgeon performed debridement and chest wall reconstruction with bilateral pectoral flaps to revise the dehiscence. Incisions were stapled or sutured. Surgical drains were placed as necessary. Immediately postoperatively, the ciNPT specialty dressing was placed over the closed incision and ciNPT (-125 mmHg) was initiated. Dressing changes occurred every 7 days.

Summary of Results 2 female and 2 male patients had a mean age of 52.8 ± 13.1 years. Comorbidities among the patients included: hypertension, coronary artery disease, hyperlipidemia, ischemic cardiomyopathy, myocardial infarction, and sternal osteomyelitis/surgical site infections. Incisions measured 20 cm on average. Incisions remained closed at dressing change/removal in all 4 patients. Drains were removed between POD 7 and POD 34. Hospital length of stay ranged from 2–13 days. One patient developed a hematoma. Patients reported reduced pain and swelling postoperatively. In all patients, incisions remained closed at 30-day follow-up appointments. There were no reports of flap failure post defect reconstruction.

Conclusions In these patients, the ciNPT specialty dressing facilitated positive healing outcomes following the revision of a sternal dehiscence. These outcomes support the use of ciNPT specialty dressings in the management of sternal dehiscence incisions.

Cardiovascular I

Concurrent session

9:00 AM

Saturday, January 30, 2021

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CARDIAC SODIUM/CALCIUM EXCHANGER IS NECESSARY FOR NORMAL ATRIOVENTRICULAR NODE FUNCTION

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Purpose of Study The sodium-calcium exchanger 1 (NCX1) is an essential component of the 'calcium clock,' one of two coupled oscillators that generates pacemaker activity in the sino-atrial node (SAN). However, it is uncertain to what degree NCX and the 'calcium clock' are responsible for pacemaker activity (i.e. escape rhythm) or conduction in the atrioventricular node (AVN). The purpose of this study was to determine whether NCX1 is required for normal automaticity and conduction through the AVN.

Methods Used We used our previously described atrial-specific NCX1 knock-out (KO) mice, which live to adulthood. We used surface electrocardiograms (ECG) in anesthetized mice during right atrial overdrive pacing to assess AV conduction. The generation of spontaneous calcium (Ca) transients in resected AVN tissue was recorded using 2D confocal microscopy. Membrane currents and voltage of isolated AVN cells were determined using single cell patch clamp.

Summary of Results In patch clamped enzymatically isolated AVN cells from NCX1 KO mice, NCX1 current was eliminated completely in about half of cells tested, while the remainder retained about 20% of WT activity (average 2.29 ± 0.23 pA/pF in WT vs 0.29 ± 0.08 pA/pF in KO). Using overdrive pacing, we observed that NCX1 KO mice developed Mobitz I second degree AV block at slower pacing rates than WT mice. AV block developed in KO mice when the pacing rate was increased by 19% whereas WT mice did not develop AV block until the rate was increased by 43% ($p < 0.0001$). In NCX1 KO mice, resected AVN tissue loaded with the Ca indicator CalBryte520 exhibited spontaneous Ca waves but little to no coordinated Ca transients. In isolated AVN cells, I_{Ca} was reduced from 3.73 ± 0.39 pA/pF in WT to 1.59 ± 0.18 pA/pF in KO. I_f was also reduced in NCX1 KO mice (-39.07 ± 10.52 in WT vs -14.71 ± 3.80 in KO). Finally, spontaneous action potentials were eliminated in almost all NCX KO AVN cells (10 out of 13).

Conclusions NCX1 and the 'calcium clock' are essential for normal AVN automaticity and conduction on the single cell, tissue, and intact mouse levels, though adaptations in other membrane currents (I_{Ca} , I_f) may also alter function.

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THE VAGRANCIES OF DONOR SELECTION: IS QUALITY THAT IMPORTANT?

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10.1136/jim-2021-WRMC.198

Purpose of Study Donor selection in heart transplant is not standardized. Many donor hearts (DH) are declined due to quality issues such as older age, low left ventricular ejection fraction, left ventricular hypertrophy, diastolic dysfunction, underlying coronary artery disease. Yet, DHs declined at one center are subsequently accepted at another center. It is not well known whether DHs declined due to quality and accepted by another program have acceptable post-transplant outcomes.

Methods Used Between 2017 and 2019, we assessed 532 DHs that were allocated to a single center (Cedars-Sinai). We declined 218 offers due to quality. We had follow-up with organ procurement organizations and found that 45 of these DHs that we turned down were accepted by another program and transplanted. 1-year post-transplant survival of these patients were compared to those patients whose donor was accepted and transplanted at Cedars-Sinai (n=314).

Summary of Results 45 declined DHs were subsequently accepted by another program and transplanted into their patients. These 45 declined DHs had the following issues: abnormal cardiac studies (n=12), donor cardiac history (n=6), other medical history including cirrhosis or infectious processes (n=6), nature of the cause of death (n=3), older age (n=14), estimated prolonged ischemic time (n=1), and other reasons (n=3). Compared to those patients transplanted at Cedars-Sinai, the declined donor recipients had similar age and gender but had a longer cold ischemic time. There were significantly fewer patients in the declined DH group compared to the Cedars-Sinai group who were listed as high urgency status at transplant (46.7% vs 78.7%, $p < 0.001$). There was no difference in 1-year patient or graft survival between the two study groups (see table 1).

Conclusions DHs declined for quality may be accepted at another program with good post-transplant survival. Contrary to belief, these DHs were mostly not transplanted into high urgency waitlist patients. Donor declines due to quality should be reviewed as they could lead to more lives saved.

Abstract 198 Table 1

| Endpoint | Declined donor hearts accepted by others (N=45) | Transplanted at Cedars-Sinai (N=314) | P-value |
|--------------------------------------|---|--------------------------------------|---------|
| Ischemic Time (hours, mean \pm SD) | 3.7 ± 1.0 | 2.9 ± 0.8 | <0.001 |
| 1-year Survival | 97.8% (44) | 91.7% (288) | 0.189 |
| 1-year Freedom from Graft Failure | 100.0% (45) | 96.8% (304) | 0.251 |

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4D-FLOW MRI INTRACARDIAC FLOW HEMODYNAMIC PATTERNS CAN PHENOTYPE PULMONARY HYPERTENSION SUBTYPES

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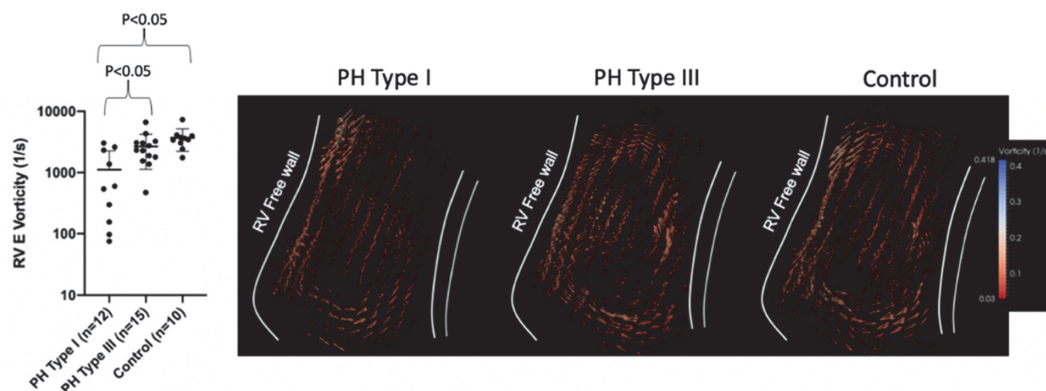
10.1136/jim-2021-WRMC.199

Purpose of Study Idiopathic Pulmonary Arterial Hypertension (PH-Type I) and PH due to pulmonary disease (PH-Type III) arise from different pathophysiologic processes, yet both culminate in increased right ventricular (RV) afterload and eventual failure. Previous investigations have demonstrated that 4D-Flow MRI-derived intracardiac vorticity (ω) correlates with markers of ventricular interdependency and diastolic dysfunction in PH, however none have attempted to use these metrics to phenotype PH subgroups. This investigation explores whether 4D-Flow MRI can detect diastolic dysfunction differences that make it possible to phenotype Type I and Type III PH.

Methods Used Type I PH patients (n=12, mean age 61 yrs), Type III PH patients (n=15, mean age 63 yrs), and healthy controls (n=10, mean age 58 yrs) underwent standard cardiac MRI and 4D-Flow MRI to determine RV intracardiac flow markers including early (ω -E) and late (ω -A) diastolic vorticity. Standard MRI-based RV and LV size and function markers were also collected.

Summary of Results ω -E was decreased in the Type I PH group compared to the Type III PH group (P=0.035) and to controls (P<0.001). There was no difference in ω -E between the Type III group and controls (P=0.216). RVEF was decreased in both the Type I (P<0.001) and Type III (P=0.012) group compared to controls. There was no difference in RVEF between the Type I and Type III groups (P=0.917). RVEDV was increased in both the Type I (P=0.008) and Type III (P=0.006) groups compared to controls. No significant differences were detected in ω -A and other RV or LV volume and functional indices.

Conclusions 4D-Flow MRI can distinguish among different PH subtypes using intracardiac diastolic vorticity. Comparative studies with standard echocardiography and catheterization are necessary to assess the sensitivity of 4D-Flow MRI to detect diastolic dysfunction.



Abstract 199 Figure 1

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PHOSPHOLAMBAN AND A-KINASE ANCHORING PROTEIN 6 MODULATION OF CALCIUM CYCLING IN THE HEART

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10.1136/jim-2021-WRMC.200

Purpose of Study Phospholamban (PLN) is an important modulator of Ca^{2+} cyclin at the sarcoplasmic reticulum (SR) of striated muscles. It inhibits sarcoplasmic reticulum Ca^{2+} ATPase (SERCA) function. Upon phosphorylation of PLN at serine 16 by protein kinase A (PKA)-dependent mechanism this inhibition is reversed. The underlying mechanism of this inhibition is not fully understood. In this study, using informatics approach, we identified A-Kinase Anchoring Protein 6 (AKAP6) as a candidate that play some roles in PLN phosphorylation.

Methods Used To demonstrate colocalizations, we performed immunofluorescence and 3D reconstruction on AKAP6 and PLN in cotransfected HEK293T cells, cultured mouse neonatal cardiomyocytes (CMNCs) and adult rat cardiomyocytes. To confirm biochemical interactions we conducted coimmunoprecipitation between wild type PLN, as well as PLN mutants (PLN-R9C, PLN-R Δ 14, PLN-L39Stop) that lead to dilated cardiomyopathy, and AKAP6. Functionally, Ca^{2+} uptake activity of AKAP6, PLN and SERCA proteins was investigated using Ca^{2+} ATPase assays.

Summary of Results Our immunofluorescence studies demonstrated colocalization between AKAP6 and PLN in cotransfected HEK293T cells and CMNCs. Coimmunoprecipitation assays further confirmed the interactions in HEK293T and isolated adult rat cardiomyocytes in response to isoproterenol stimulation. PLN mutations exhibited altered interaction with cotransfected AKAP6, compared to wild type PLN. Functionally, AKAP6 promoted Ca^{2+} uptake activity of SERCA1 in cotransfected HEK293T cells despite the presence of PLN. These results were further confirmed in adult rat cardiomyocytes. Immunofluorescence showed colocalization of both proteins around the perinuclear region. Protein-protein interaction was identified by immunoprecipitation specifically in the nucleus enriched fraction of rat hearts.

Conclusions Our results are suggestive of regional regulation of PLN by AKAP6 at perinuclear region. Our findings suggest AKAP6 as a novel interacting partner to PLN in HEK293T and murine cardiomyocytes.

201 MYOCARDIAL INJURY BUT NOT DYSFUNCTION IDENTIFIES HOSPITALIZED PATIENTS WITH COVID-19 AT HIGH MORTALITY RISK

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10.1136/jim-2021-WRMC.201

Purpose of Study Myocardial injury is clinically defined by an elevated cardiac troponin (cTn) value above the 99th percentile upper reference limit and is frequently reported in hospitalized adults dying from Coronavirus disease 2019 (COVID-19). However, the relationship between myocardial injury and dysfunction i.e. left ventricular ejection fraction (LVEF) < 50% by echocardiogram is not yet reported. Our objective was to evaluate this relationship in a single center using a pragmatic approach.

Methods Used The electronic medical records (EMR) of hospitalized patients with COVID-19 from 3/1 to 9/19/2020 were reviewed using SlicerDicer, an EMR self-service search tool. Survival, demographics, clinical, laboratory and echocardiographic data were analyzed as a function of myocardial injury.

Summary of Results Of the 328 patients evaluated, 240 (73%) had a high-sensitivity cTn T (hs-cTnT) test, as a serum biomarker for myocardial injury. Among those tested, 102 (42.5%) had at evidence of myocardial injury. Patients with injury had a significantly higher rate of in-hospital mortality compared to those with a negative test or no test (29.4% vs. 3.5%, $p < 0.001$, unadjusted OR 11.4, 95% CI 5.0 – 25.9). Among patients with myocardial injury with echocardiograms, there was no significant difference in LVEF between the patients who died ($n=14$) and those who survived ($n=27$), (52.4% vs 60.8%, $p = 0.072$). Age over 50 years (OR 6.1, 95% CI 3.1 – 11.7, $p < 0.001$), hypertension (OR 4.6, 95% CI 2.8 – 7.5, $p < 0.001$), coronary artery disease (CAD) (OR 4.3, 95% CI 1.9 – 9.8, $p < 0.001$) and male sex (OR 1.8, 95% CI 1.1 – 2.9, $p = 0.019$) were associated with injury. BMI > 30 kg/m² was associated with a negative hs-cTnT test or no test (OR 0.6, 95% CI 0.4 – 1.0, $p = 0.031$). Diabetes and chronic obstructive pulmonary disease had no association with myocardial injury.

Conclusions Among adult hospitalized COVID-19 patients, myocardial injury, but not LV dysfunction, was associated with a higher rate of in-hospital death. Further prospective studies are needed to understand how COVID-19 contributes to myocardial injury and death, without inducing dysfunction in older hypertensive patients with CAD if death is to be prevented.

202 DONOR HEART CORONARY CALCIFICATION: IS IT BAD?

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10.1136/jim-2021-WRMC.202

Purpose of Study The donor shortage in heart transplantation (HTx) has led to programs accepting older donors. Coronary calcification is common in older people and is known to correlate with underlying coronary artery disease. It is not known whether these donors with coronary calcification impart an increased risk for the recipient to develop cardiac allograft vasculopathy.

Methods Used Between 2010 and 2017, we assessed 31 heart transplant patients who were found to have coronary calcification within the first 3 months after heart transplantation, either by coronary angiography or chest CT scans. These patients were compared to a contemporary cohort of 192 patients (transplanted with donors >30 years old) without coronary calcification for the following outcomes: 3-year survival, 3-year freedom from cardiac allograft vasculopathy (CAV, as defined by stenosis $\geq 30\%$ by angiography), 3-year non-fatal major adverse cardiac events (NF-MACE: myocardial infarction, new congestive heart failure, percutaneous coronary intervention, implantable cardioverter defibrillator/pacemaker implant, stroke), and 1-year freedom from any treated rejection (ATR), acute cellular rejection (ACR), and antibody-mediated rejection (AMR).

Summary of Results Those patients with donor coronary calcification compared to those without had a significantly lower 3-year freedom from CAV (64.5% vs 85.9%, $P=0.001$). There was no significant difference in 3-year survival, freedom from NF-MACE, and 1-year rejection episodes. The severity of CAV observed in the donor coronary calcification group included: CAV1 = 13, CAV2 = 1, CAV3 = 0.

Abstract 202 Table 1

| Endpoints | HTx Patients with Coronary Calcification (n=31) | HTx Patients without Coronary Calcification (n=192) | P-value |
|-----------------------------|---|---|---------|
| 3-Year Survival | 87.1% | 83.3% | 0.591 |
| 3-year Freedom from CAV | 64.5% | 85.9% | 0.001 |
| 3-Year Freedom from NF-MACE | 74.2% | 79.7% | 0.492 |
| 1-Year Freedom from ATR | 87.1% | 86.5% | 0.790 |
| 1-Year Freedom from ACR | 96.8% | 93.8% | 0.464 |
| 1-Year Freedom from AMR | 96.8% | 95.3% | 0.690 |

Conclusions Donor coronary artery calcification appears to be a marker for greater risk for developing CAV after heart transplantation. Caution must be taken to accept these organs and if accepted, early modification of immunosuppression with a proliferation signal inhibitor may be indicated.

203 PROPHYLAXIS FOR CHAGAS DISEASE REACTIVATION: IS IT NECESSARY?

M Oda*, T Singer-Englar, N Patel, M Hamilton, J Kobashigawa. *Smidt Heart Institute, Cedars-Sinai, Los Angeles, CA*

10.1136/jim-2021-WRMC.203

Purpose of Study Chagas disease (CD) is a well-known parasite known to be reactivated in organ transplant patients who are on immunosuppression. The incidence of CD has been increasing in southern California mainly due to the parasite

increasing its endemic area from South America to Central America to the southwest United States. Several patients have contracted this disease which has led to the development of Chagas cardiomyopathy to the point that they required heart transplantation. These patients are at risk for reactivation of CD after heart transplant due to immunosuppression. There are now prophylaxis medications available, however it has not been clearly established whether prophylaxis is effective in preventing reactivation of infection.

Methods Used Between 1999 and 2019, we assessed 13 heart transplant patients who had a history of CD prior to transplant. These patients were monitored closely post-transplant with CD serologies at 1-, 3-, 6-, 12-months post-transplant. 7 of these patients were given prophylaxis with nifurtimox (n=2) or benznidazole (n=5) as they were found to have IgG antibodies to CD. The other 6 patients did not develop antibodies and were not given prophylaxis. Outcome of these 2 groups of patients were compared for symptomatic disease and 1- and 5-year survival.

Summary of Results Of the 13 patients with history of CD, 1 patient (prophylaxis group) developed symptomatic disease and recovered. Following prophylaxis therapy, none of the 7 patients had reactivation of CD. Reactivation occurred in 3 of the 6 no treatment patients. The prophylaxis patients compared to the no treatment group had better 1- and 5-year survival (see table 1). However, the causes of death for the no treatment group was non-liver related except for 1 patient who may have died from CD-related disease.

Abstract 203 Table 1

| Outcome | Treated with Benznidazole or Nifurtimox (n=7) | No Treatment (n=6) | P-value |
|---------------------|---|-----------------------|---------|
| Reactivation | 100.0% | 50.0% | 0.070 |
| Symptomatic Disease | 14.3% | 0.0% | 1.000 |
| 1-Year Survival | 100.0% | 66.7% | 0.110 |
| 5-Year Survival | 100.0% | 50.0% | 0.040 |

Conclusions Heart transplant patients with a history of CD appear to have acceptable outcome when closely monitored and administered prophylaxis when indicated. Administration of prophylaxis to all CD, even without IgG antibodies, should be considered.

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BROMOCRIPTINE IMPROVES CENTRAL AORTIC HEALTH IN ADOLESCENTS WITH TYPE 1 DIABETES

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10.1136/jim-2021-WRMC.204

Purpose of Study The presence of global vascular dysfunction and central aortic stiffness is a well-recognized feature in youth with type 1 diabetes (T1D). This predisposes young patients to the life-long exposure to elevated ventricular afterload and increased incidence of cardiovascular events. Therapeutic strategies to mitigate vascular dysfunction are urgently needed. We hypothesized that bromocriptine quick release

(BCQR) therapy would improve vascular health in youth with T1D.

Methods Used This was a placebo-controlled, random-order, double-blinded, cross-over study investigating BCQR as adjunct therapy on central aortic stiffness as measured by phase-contrast MRI. Participants also underwent flow mediated dilation test and brachial distensibility evaluation using tonometry. Adolescents with T1D were randomized 1:1 to phase-1 of 4-week BCQR (minimum dose 1.6 mg daily) or placebo therapy after which all vascular measurements were performed. Following a 4-week washout period, phase 2 was performed in identical fashion with the alternate treatment.

Summary of Results Forty-two adolescents (mean age 15.9 yrs, HbA1c 8.6%, BMI%ile 71.4, TD duration 5.8 yrs) with T1D were enrolled. BCQR therapy decreased systolic ($\Delta = -5$ mmHg, $p < 0.001$) and diastolic blood pressure ($\Delta = -2$ mmHg, $p = 0.039$). BCQR therapy reduced ascending aortic pulse wave velocity (PWV) ($\Delta = -0.4$ m/s, $p = 0.005$), and increased relative area change (RAC) ($\Delta = -2.6\%$, $p = 0.022$), and distensibility ($\Delta = 0.08\%/mmHg$, $p = 0.010$). In the thoraco-abdominal aorta, BCQR decreased PWV ($\Delta = -0.2$ m/s, $p = 0.013$) and increased distensibility ($\Delta = 0.05\%/mmHg$, $P = 0.032$). In contrast, BCQR decreased reactive hyperemia index (RHI) ($\Delta = -0.34$, $p = 0.006$).

Conclusions BCQR therapy improved central aortic stiffness and pressure hemodynamics in adolescents with T1D over 4 weeks. However, BCQR decreased peripheral RHI. BCQR therapy might serve as a potential clinical intervention to attenuate accelerated aortic stiffness in youth with T1D supporting future longer-term studies.

Neonatology – perinatal biology II

Concurrent session

9:00 AM

Saturday, January 30, 2021

205

IGF-1 INFUSION IN LATE GESTATION FETAL SHEEP DOES NOT INCREASE BETA-CELL REPLICATION AND INHIBITS INSULIN SECRETION

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Purpose of Study Insulin and insulin-like growth factor-1 (IGF-1) are fetal growth hormones with overlapping mechanisms of action. Complications of pregnancy such as gestational diabetes can lead to higher fetal insulin and IGF-1 concentrations and fetal overgrowth. Insulin secretion is determined by β -cell function and number, and IGF-1 increases β -cell replication *in vitro*. We previously demonstrated that a 7 d infusion of IGF-1 LR3 into late gestation fetal sheep increased fetal weight but lowered plasma insulin concentrations despite higher pancreatic insulin content. Therefore, we hypothesized that IGF-1 LR3 would attenuate fetal glucose-stimulated insulin secretion (GSIS) and increase β -cell replication.

Methods Used Late gestation fetal sheep were infused with IGF-1 LR3 (IGF-1, n=8) or saline (CON, n=9) for 7 d. Fetal arterial plasma insulin and glucose were measured. On the final day of infusion (133±2 days gestation; term 147 d), GSIS was measured with a hyperglycemic clamp. β -cell replication was measured in pancreases from a second cohort of fetuses (IGF-1, n=8; CON, n=7) with triple immunofluorescence for insulin, DAPI, and Ki-67. Data were analyzed by Student's T-test or ANOVA.

Summary of Results Plasma insulin and glucose concentrations in IGF-1 fetuses were 57% and 15% lower, respectively, at the end of infusion compared to CON ($P<0.05$). During the GSIS study, hyperglycemic clamp glucose concentrations were similar, but insulin concentrations were lower in IGF-1 fetuses versus CON ($P<0.05$). The percentage of Ki-67⁺ β -cells was not different between groups.

Conclusions IGF-1 LR3 lowers plasma insulin and attenuates GSIS in late gestation fetal sheep but does not induce β -cell replication. Higher pancreatic insulin content with lower insulin secretion indicates the defect in GSIS is not due to an inability to synthesize insulin. Fetal hypoinsulinemia and hypoglycemia may have prevented the expected increase in β -cell replication. We speculate that alterations in the insulin/IGF-1 axis inhibit β -cell development and contribute to the long-term reduction in β -cell function following pregnancies complicated by diabetes or fetal overgrowth.

206 METABOLIC PATTERNS OF INFANTS BORN TO MOTHERS WITH PREECLAMPSIA AND DIABETES SHOW UNDERLYING METABOLIC VULNERABILITY

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10.1136/jim-2021-WRMC.206

Purpose of Study Pregnancy conditions such as preeclampsia and diabetes can profoundly affect fetal and newborn growth and consequent newborn health. Disturbances in intrauterine metabolism and associated molecular mediators of fetal growth alterations remains poorly defined. The objective of this study is to determine whether there is a metabolic pattern at birth associated with infants born to mothers with preeclampsia or diabetes.

Methods Used Case-control study of 41,412 infants born in California between 2005 - 2010 with newborn screen results matched with California Perinatal Quality Care Collaborative and California Office of Statewide Health Planning and Development birth and hospitalization records. Elastic net logistic regression modeling with repeated 10-fold cross validation, where controls were defined as samples where the clinical record did not indicate the presence of any of the maternal outcomes of interest.

Summary of Results A select grouping of analytes consistently demonstrated area under the receiver operating characteristics > 0.80 for maternal conditions including type 1 diabetes, severe preeclampsia and severe preeclampsia with preexisting hypertension. Short chain acylcarnitines and free carnitine were significantly associated with maternal diabetes. Acetylcarnitine, free carnitine and ornithine were significantly associated

with severe preeclampsia and preeclampsia with preexisting hypertension.

Conclusions This population study observed unique newborn metabolite patterns associated with the common maternal conditions of preeclampsia and diabetes. Several metabolites were common to the maternal morbidity, either hypertensive disorder or diabetes. The unique metabolic patterns associated with the maternal conditions suggest that new metabolic markers may be used to determine degree of neonatal morbidity secondary to intrauterine conditions.

207 ABSTRACT WITHDRAWN

208 A PROSPECTIVE STUDY OF PLACENTAL IMAGING AND PREGNANCY OUTCOMES IN THE SETTING OF ISCHEMIC PLACENTAL DISEASE AND GESTATIONAL DIABETES

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10.1136/jim-2021-WRMC.207

Purpose of Study Ischemic placental disease (IPD) and gestational diabetes (GDM) are conditions that adversely affect placental growth, perfusion, and maternal and fetal outcomes. Ultrasound doppler studies can indirectly measure placental function, but the positive predictive value and sensitivity are poor in the prediction of pregnancy outcomes. More recently, MRI studies of placental blood flow have shown potential in the prediction of adverse pregnancy outcomes.

The purpose of this study is to record maternal development of IPD and GDM, and assess their correlation to pregnancy and neonatal outcomes. We will determine any associations between placental MRI findings, and pregnancy outcomes and placental pathology.

Methods Used We recorded the maternal medical history and pregnancy course through 4 study visits (11–14 weeks, 19–22 weeks, 36 weeks, and at delivery). Postnatal outcomes up to 4 months were documented. Placental pathology was performed through our pathology department. Placental MRIs were performed using volumetric free-breathing technique for placental imaging and measurement of regional placental perfusion. Chart reviews were conducted on the subjects and their newborns to gather maternal and infant clinical data. Data was analyzed using REDCap.

Summary of Results

IPD: A total of 199 subjects were included for the analysis. 43 (23.9%) of women developed IPD; 46 (25.6%) developed inflammatory disease, and 91 (50.6%) did not develop either. Of the women with IPD, 20 (41.7%) had gestational hypertension, 18 (37.5%) had preeclampsia, and 9 (18.8%) had FGR. No women had placental abruption.

GDM: 22 women developed GDM; 14 by the second study visit, and 8 by the third study visit. 3 women had diabetes prior to pregnancy. Of these women, 39% were insulin-controlled; 3% were controlled by an oral hypoglycemic agent, and 50% were diet-controlled.

MRI: 199 women completed two pCASL MRI scans, at 14–18 weeks and at 19–24 weeks.

Conclusions Our data analysis is currently ongoing. We will evaluate pregnancy outcomes, such as any placental pathology and neonatal morbidities and mortalities, and correlate them with the development of IPD and GDM. We will also correlate our MRI findings with pregnancy outcomes, neonatal outcomes, and placental pathology.

209 EFFECTS OF AN ORAL PROBIOTIC PREPARATION ON THE VAGINAL MICROBIOME DURING EARLY PREGNANCY

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10.1136/jim-2021-WRMC.208

Purpose of Study The vaginal microbiome can influence pregnancy outcomes, with a decrease in *Lactobacillus* species being associated with adverse outcomes such as preterm birth. There may be certain protective bacteria, such as *Lactobacillus*, that can be used to prevent these adverse pregnancy outcomes. Previous studies have had conflicting findings regarding the effectiveness of using oral probiotics to increase levels of protective bacteria within the vaginal microbiome. This study investigated whether the administration of an oral probiotic preparation containing *Lactobacillus* species during early pregnancy could increase the levels of protective bacteria present in the vaginal flora.

Methods Used DNA was extracted from patient samples taken from the vagina, anus, and urine prior to and after intervention. qPCR was performed on the extracted vaginal DNA to analyze the relative abundance of different bacterial strains between the experimental and control groups.

Summary of Results The qPCR results indicated no significant difference between the relative enrichment and expression of *Lactobacillus* species both pre- and post-treatment between the experimental and control groups. The pre- and post-enrichment data also revealed that there was no uniform trend for any change in enrichment for either the experimental or control groups.

Conclusions The vaginal microbiome did not significantly change after administration of the oral probiotic preparation used in this study, with the overall vaginal microbiome remaining relatively stable across the first half of pregnancy.

210 MATERNAL ANTENATAL MARIJUANA USE LOWERS THE BIOLOGIC POTENTIAL OF UMBILICAL CORD MESENCHYMAL STEM CELLS

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10.1136/jim-2021-WRMC.209

Purpose of Study Human umbilical cord derived mesenchymal stem cells (MSCs) have been extensively studied with therapeutic efficacy in several injury models. Our work has shown therapeutic efficacy of MSCs and their secreted factors in experimental neonatal chronic lung disease and pulmonary hypertension models. Maternal antenatal drugs and disease states can affect the efficacy of MSCs. At present, very limited data are available on maternal marijuana use during pregnancy affecting the MSC biologic potential.

We hypothesized that human umbilical cord Wharton's jelly MSCs harvested from marijuana exposed cords will lack biologic potential compared with non-exposed cords. Our aims were:

1. To generate human umbilical cord MSCs from marijuana exposed and non-exposed cords.
2. To determine in vitro properties and secreted factors between the two groups.

Methods Used Human umbilical cord Wharton's jelly MSCs from marijuana exposed and non-exposed umbilical cords were isolated and cultured according to our modified protocols. Marijuana exposure was considered positive if mothers have smoked marijuana within the prior two weeks before delivery with a positive urine drug test. In vitro growth, differentiation, and secreted factors were analyzed utilizing duplication time, Western immunoblot, and proteomics analysis.

Summary of Results MSCs were harvested from 3 pooled marijuana exposed cords with 3 non-exposed cords as control. Marijuana exposed MSCs had much shorter duplication and differentiation time compared to non-exposed MSCs. Interestingly, although the marijuana exposed MSCs grew faster, they had lower concentration of cardiopulmonary protective secreted factors compared to non-exposed MSCs.

Conclusions Marijuana exposure during pregnancy leads to a reduction in biologic potential of human umbilical cord MSCs. Further in vitro and in vivo studies are underway to determine the extent of this relationship.

211 ROLE OF ALTERNATIVE SPLICING IN LEFT VS RIGHT VENTRICLE IN NEONATAL MOUSE HEART MATURATION

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10.1136/jim-2021-WRMC.210

Purpose of Study Alternative splicing (AS) of messenger RNA (mRNA) is known to play an important role in development of the mammalian heart. Distinct transcriptomic profiles between the left ventricle (LV) and right ventricle (RV) have been documented under both normal and pathologic conditions. We hypothesized that alternative mRNA splicing events are important regulators of chamber specificity during neonatal heart maturation.

Methods Used To profile the transcriptome of the LV and RV, deep RNA-seq was performed on male neonatal mouse (C57BL/6) LV and RV at three time points of perinatal circulatory transition: P0, P3 and P7. AS events were identified and quantified using rMATs (robust Multivariate Analysis of Transcript splicing). For functional assessment, gene ontology (GO) analysis was performed.

Summary of Results 1162 AS events were identified during perinatal heart maturation, with exon skipping events accounted for 44%. Interestingly, the majority of identified exon skipping events were specific to either LV or RV. Although some events overlapped between the two ventricles, these events exhibited different pattern of regulation between LV and RV throughout neonatal heart maturation windows. Further characterization of the differentially spliced exon skipping events, using GO analysis, revealed significant functional

enrichment with mRNA processing, lipid metabolism and transcriptional regulation.

Conclusions These results suggest that alternative splicing events contribute to regulation of chamber specificity during postnatal heart maturation. Additional bioinformatics and mechanistic studies of potential splicing regulators may reveal targets for chamber-specific therapies.

Neuroscience II

Concurrent session

9:00 AM

Saturday, January 30, 2021

212 PREHOSPITAL HEMODYNAMIC STATUS AND NEUROLOGIC OUTCOMES FOLLOWING ACUTE TRAUMATIC SPINAL CORD INJURY

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10.1136/jim-2021-WRMC.211

Purpose of Study Current treatment of traumatic spinal cord injury (SCI) targets secondary neurological injuries, such as hypoperfusion and ischemia, that underlie much of the pathophysiology following a traumatic SCI. This study investigates the correlation between prehospital mean arterial pressure (MAP) and the degree of neurological recovery.

Methods Used In this retrospective cohort study, conducted at a large level 1 trauma center, acute traumatic SCI patients from 2017–2019 were assessed for neurologic recovery at discharge from hospital and inpatient rehabilitation. Neurologic outcome was measured as the change in the American Spinal Injury Association (ASIA) motor score at the outcome time points. Major exclusionary criteria included: greater than two days from time of injury to spinal decompression surgery, age <16 years old, insufficient prehospital data, and missing/incomplete motor exams. Prehospital MAP exposure was characterized for each subject using an area-under-the-curve approach. The total bounded area below 85 mmHg was calculated over the entire monitoring period, then divided by the duration of monitoring to achieve a normalized 'average depth' MAP value. 85 mmHg was used as the threshold value for this analysis as it represents the current MAP target in SCI treatment. Linear regression was used to examine the relationship of prehospital MAP values with the change in motor score.

Summary of Results The chart review identified n=109 patients at hospital discharge and n=79 at rehab discharge who met the study's inclusion criteria. Linear regression analysis demonstrated a non-significant (p>0.05) relationship between average depth MAP values and change in the motor score at both hospital discharge and rehab discharge.

Conclusions Prehospital MAP values below the current clinical recommendations of 85 mmHg did not show a significant association with motor score change in traumatic SCI patients. Further work is necessary to adjust for confounders as well as validate these findings in additional settings.

213 THYROID HORMONE TREATMENT REVEALS PLASTICITY OF GENE EXPRESSION IN CONE PHOTORECEPTORS OF ADULT ZEBRAFISH

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10.1136/jim-2021-WRMC.212

Purpose of Study Vertebrate color vision requires opsin-containing cone photoreceptor cells in the retina. A popular model of the human long and medium wavelength sensitive (LWS/MWS) opsin tandem array suggests an upstream regulatory region interacts with replicated opsin genes at random, then associates with only one opsin gene such that mature cones do not express more than one opsin. However, our prior studies investigating the orthologous long wavelength sensitive (*lws1/lws2*) array in zebrafish suggest that thyroid hormone (TH) and retinoic acid serve as trans regulators of this gene array in larvae/juveniles. This study investigates whether cone opsin expression remains plastic to TH treatment in adult zebrafish, where cone distribution is considered stable.

Methods Used Adult WT zebrafish were treated with NaOH (control) or TH for 1 day or 5 days (n=12, 6 fish each). Left eyes were harvested for quantitative polymerase chain reaction (qPCR) analysis and right eyes for cryosections and in situ hybridization. A set of *lws* reporter transgenics were also treated for 5 days with TH (n=6). The eyes underwent cryosectioning and confocal imaging.

Summary of Results In adult zebrafish, exogenous TH drastically increased *lws1* expression in both 1 day and 5 day-treated groups (p= 4.51*10⁻¹², 2.02*10⁻⁹ respectively). Other opsin genes that were shown to decrease in embryos and juveniles in response to TH also showed a significant decrease in both groups: *lws2* (p=4.07*10⁻⁰⁷, 4.72*10⁻¹⁰ respectively); *gnat2b* (p=5.49*10⁻⁰⁷, 6.29*10⁻⁴ respectively). TH treated transgenic *lws* reporter line revealed a clear switch from *lws2* to *lws1* dorsally, consistent with the qPCR data. This confirms that there is not only a shift in *lws1/2* expression but also changes in topographic distribution of *lws1/2*-expressing cones of adult zebrafish in response to TH.

Conclusions Exogenous TH induced a drastic shift from *lws2* to *lws1* in adult zebrafish, consistent with previous studies of larvae and juveniles. This shift occurs as rapidly as 1 day when exposed to TH, which shows that cones remain significantly plastic even into adulthood. Plasticity in overall spectral sensitivity (to be sensitive to higher wavelengths) in response to TH suggests a role in visual system function well into adulthood.

214 BIOINFORMATIC COMPARISON OF GREY MATTER: CONTROL TISSUE V MULTIPLE SCLEROSIS

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10.1136/jim-2021-WRMC.213

Purpose of Study Multiple Sclerosis is an immune-modulated demyelinating disease of the CNS. Recently, grey matter lesions and atrophy have been found to contribute to the disease state. This study was designed to examine the differences of gene expression between post-mortem samples of grey

matter from controls, MS normal-appearing grey matter (NAGM), and MS lesion grey matter (LGM). We sought to identify genes that may play a role in early stages of MS by comparing normal-appearing grey matter (NAGM) and grey matter with lesions (LGM) to healthy controls.

Methods Used Samples from a study previously submitted to NCBI's Gene Expression Omnibus, GSE131282 by Enz et al, 2020, were analyzed in multiple comparisons using GEO2R analysis tool, processed in Excel, and identified using Database for Annotation, Visualization and Integrated Discovery (DAVID 6.8) to obtain Gene Ontology (GO) terms and Kyoto Encyclopedia of Genes and Genomes (KEGG) enrichment results of differentially expressed genes. In Excel, GO terms with a P-Value < 0.01 were sorted into categories for ease of visualization and their up- or downregulation average was determined using Logarithmic Fold Change (Log FC). KEGG pathway results with P-Value < 0.01 were used to search literature for a known connection to MS.

Summary of Results A greater number of significant genes, GO terms, and KEGG pathways were found in Comparison D: NAGM v LGM than in B: Control v LGM or C: Control v NAGM. Gene expression on average was downregulated in all GO categories for all comparisons except one, Comparison J: Frontal NAGM v Parietal NAGM. No significant genes were expressed within each tissue type when frontal and parietal tissue samples were compared except NAGM, in which one GO term, 'nuclear body', was upregulated. In all other comparisons the genes within this group were downregulated. A total of 30 KEGG pathways were found in this review, 13 have known connections to MS, and 17 do not.

Conclusions The greater number of significant genes, GO terms, and KEGG pathways in Comparison D above Comparisons B and C indicates greater difference between NAGM and LGM than between either tissue and control. The results of Comparison J elicit further research. We identified 17 KEGG pathways that are not known to have connection to MS.

215 WORKERS WITH HIGHER STRESS LEVELS HAVE ALTERED DYNAMIC NEUROIMAGING

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10.1136/jim-2021-WRMC.214

Purpose of Study The adverse mental, physical and performance effects of stress are well documented. The central nervous system correlates of chronic stress are not well established. Those working in prisons (correction professionals [CPs]) have high stress levels. We used functional MRI to assess whether cognitive processes differed among higher and lower stress CPs.

Methods Used Participants were recruited from a cross-sectional study of CPs. An established self-report stress index stratified the sample (total = 328), and the lowest and highest quartile were invited to undergo fMRI imaging. 25 lower stress (mean \pm SD stress score 6.32 ± 0.95) and 25 higher stress individuals (stress score 13.10 ± 1.76) were imaged. While scanned participants performed a manual-response version of the standardized Stroop task. Functional images were acquired with a GE Signa 3T MRI scanner with a T2*-weighted gradient-echo planar imaging.

Summary of Results Stress scores were repeated the day of imaging, and the two scores were highly correlated ($r^2 = 0.7$, $p < 0.001$), suggesting consistent groupings. Groups were not different in demographic and basic biometrics (blood pressure, BMI, C-reactive protein, hemoglobin A1c, lipids, cortisol). Higher stress participants had greater activation of a frontal-parietal executive network implicated in cognitive control ($p < 0.01$, uncorrected). In particular, higher stress group demonstrated robust activation of the posterior dorsolateral prefrontal cortex and middle frontal gyrus. Both regions are involved in maintaining attention when conflicting information is relevant. In contrast, the lower stress group demonstrated greater activation of regions that may be involved in basic visual processing.

Conclusions Results provide evidence that stress impacts functional activation of neural systems involved in cognitive control. More stressed CPs appeared to need greater top-down control when information was conflicting.

216 LEARNING TYPES DURING INTERPRETATION BIAS TRAINING TO TREAT IRRITABILITY

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10.1136/jim-2021-WRMC.215

Purpose of Study A potential treatment target for chronic irritability is hostile interpretation bias (HIB), a tendency to interpret ambiguous stimuli as threatening. HIB may be targeted and changed via a computer-based interpretation bias training (IBT). IBT is amenable to the application of category learning theory to measure behavioral and neural changes. The goal of this study was to apply a principled, model-based analysis of categorical learning to identify learning types during IBT.

Methods Used A session of IBT learning was assessed in 63 transdiagnostic youth with varying severity of irritability and anxiety. Participants judge a continuum of facial expressions and train in IBT towards less angry and more happy judgments of ambiguous faces on the continuum. A computational model of categorical learning, ALCOVE, was applied to each person's training data. Two major model parameters were of interest: 1) learning rate with higher values representing a greater speed at which individuals change their associations to faces, and 2) generalization with higher values reflecting a lower precision of applying feedback to a specific face on the morph continuum. We assessed associations with psychopathology, (anxiety and irritability), dimensionally via multivariate linear models. We then empirically assessed for types of learners using generalized mixture models.

Summary of Results The computational model demonstrates different types of IBT learners with unique associations to age and psychopathology. In multivariate linear modeling, individuals with higher generalization tended towards anxiety ($b=1.7$ (0.9), $p=.05$) and were younger ($b=-0.5$ (0.2), $p=0.02$). Learning rate was reduced with both anxiety and irritability ($b=-0.11$ (0.04), $p=0.01$). Generalized mixture modeling identified two learning types, those with very high generalization and those with lower generalization. Younger individuals were more likely to be in the high generalization group (Cohen's $d=0.66$, $p=0.01$).

Conclusions The model-based analysis empirically detected distinctive pathology and age associated learning styles. Understanding learning will improve the ability to identify learning types, improving precise prescription of IBT.

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IMPACT OF OBESITY ON BRAIN RESPONSE TO FOOD CUES FOLLOWING NON-NUTRITIVE AND NUTRITIVE SWEETENER INGESTION

AG Yunker*, S Luo, S Jones, B Angelo, AW DeFendis, K Page. *University of Southern California, Los Angeles, CA*

10.1136/jim-2021-WRMC.216

Purpose of Study Non-nutritive sweeteners (NNS) are marketed for weight loss by providing sweet taste without calories, but the health consequences of NNS are debated. Uncoupling sweet taste from calories may stimulate feeding through neural mechanisms, yet the impact of obesity on neural responses to NNS vs caloric sugars is unknown. We examined brain responses to high-calorie (HC) food cues after acute consumption of sucralose (NNS) vs. sucrose (caloric sugar) in obese, overweight, and lean individuals.

Methods Used On 2 separate visits, 72 adults (26 lean, 24 overweight, 22 obese) consumed a drink containing sucrose (75 g) or sucralose (sweetness matched) and underwent a functional magnetic resonance imaging food cue task that measured the blood-oxygen-level-dependent (BOLD) response to HC food and non-food cues. *A priori* brain regions-of-interest (ROI) are areas implicated in feeding regulation: the nucleus accumbens, amygdala, dorsal striatum, medial frontal cortex (MFC), hippocampus, insula, orbital frontal cortex (OFC), and hypothalamus. Linear mixed models were used to examine neural reactivity to HC food cues in response to sucralose vs sucrose. We tested for interactions between BMI group and drink, and stratified results by BMI group. Analyses were adjusted for age and sex. False discovery rate (FDR) was applied to p-values to correct for multiple ROI comparisons.

Summary of Results We found BMI group by drink interactions in the MFC ($p=0.04$); individuals with obesity had greater MFC reactivity ($\beta=0.39$, $p=0.02$) after consuming sucralose vs sucrose than overweight ($\beta=0.05$, $p=0.93$) and lean ($\beta=-0.002$, $p=0.98$) persons. While there was no BMI group by drink interaction in the OFC ($p=0.28$), individuals with obesity, but not overweight or lean, had greater OFC responses to HC food cues after sucralose vs sucrose ($\beta=0.20$, $p=0.02$). Similar patterns were seen in other ROIs but did not survive multiple comparisons.

Conclusions Obesity was related to heightened cortical responses to HC food cues after acute consumption of sucralose vs. sucrose. These findings highlight the need to consider obesity-related effects on the neurobehavioral consequences of NNS consumption.

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ASCORBIC ACID ATTENUATES HYDROGEN PEROXIDE INDUCED OXIDATIVE STRESS AND OSTEOBLASTS DEMONSTRATE ANTIOXIDANT RECYCLING POTENTIAL

RT Tran*, J Morgenstern, S Droho, J Olson. *University of Colorado – Anschutz Medical Campus, Englewood, CO*

10.1136/jim-2021-WRMC.217

Purpose of Study Oxidative stress is strongly implicated in disease progression of age-related macular degeneration. Oral supplements, including ascorbic acid (AA), target this oxidative etiology, yet efficacy is limited due to insufficient ocular distribution. One possible avenue is restoring the antioxidant potential of the vitreous by improving recycling of the inactive oxidized form of AA, dehydroascorbic acid (DHA), back to its active reduced form. Here, we demonstrate the antioxidant potential of AA to improve common retinal pigment epithelium (ARPE-19) cell viability in the setting of H_2O_2 induced oxidative stress and evaluate osteoblasts as a potential source of antioxidant recycling.

Methods Used In vitro evaluation was performed by incubating ARPE-19 in culture media containing 0.2 mM H_2O_2 with and without 100 μ M AA. MTT assay was performed to assess for cell viability. Osteoblast antioxidant recycling potential was tested by exposing MG-63 osteosarcoma cells to culture media containing 100 μ M DHA. At each time point from 0 to 80 minutes, media was collected and concentrations of DHA and AA were assessed using HPLC. Statistical comparisons were performed using a student's t-test.

Summary of Results AA successfully attenuated the toxic effects of H_2O_2 , with 88% of ARPE-19 cells remaining viable after exposure to both H_2O_2 and AA, compared to 61% viable after incubation with H_2O_2 alone ($P < 0.001$). Osteoblast antioxidant recycling of DHA was observed with an increase of AA concentration and a concomitant decrease in DHA levels over time. At 80 minutes, the concentration of AA had a 2-fold increase with a paired 2-fold decrease in DHA levels.

Conclusions These experiments demonstrate the antioxidant potential of AA to attenuate the effects of oxidative stress and its physiologic importance in managing cellular exposure to reactive oxygen species. Osteoblasts exhibited the potential for antioxidant regeneration of AA outside their biological niche. While preliminary, these results demonstrate the promise of an implantable device that continuously recycles antioxidant, eliminating the need for constant injections.

219

NOVEL METHODOLOGY FOR PROBING MICROGLIAL METABOLISM IN SITU

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10.1136/jim-2021-WRMC.218

Purpose of Study Microglia play a role in the pathogenesis of multiple sclerosis (MS) and other neurodegenerative diseases (ND) by taking on both adaptive and injurious phenotypes in response to their environment. Understanding adaptive phenotypes may guide the development of novel therapeutics. Recent single-cell RNA sequencing (scRNAseq) analyses of microglia *ex vivo* found that genes associated with lipid and lipoprotein metabolism are tightly regulated during ND. We hypothesize that microglial activation is paired with a metabolic switch that is key in the development of ND. However, our current understanding of microglial metabolism draws on what is known about peripheral macrophages and invasive techniques like scRNAseq that could alter microglial phenotype and metabolism. Therefore, there is a need for methodologies that allow assessment of microglial

metabolism *in situ*, as a first step to develop metabolism-focused interventions.

Methods Used We take advantage of endogenous fluorophore NADH to probe the metabolic profile of microglia *in situ* via fluorescence lifetime imaging microscopy (FLIM). This technique excites NAD in the sample, and tracks the fluorescence lifetime (FLT) to determine whether it is free or enzyme-bound. More free NADH suggests more glycolysis taking place and presents as a longer NAD FLT, whereas bound NAD indicates more oxidative phosphorylation. We use an experimental autoimmune encephalitis (EAE) mouse as a model of MS and neuroinflammation. Mice were scored based on the severity of their MS-like symptoms. Brains were frozen before sectioning and analysis.

Write out

Summary of Results Preliminary data in high and low scoring EAE mice suggest that a higher score is associated with a shorter NAD FLT. This suggests a higher reliance on glycolysis to meet energy demands in an MS model. This also suggests that microglia have adopted an injurious phenotype.

Conclusions The data support our hypothesis that microglial activation in the setting of MS is paired with a metabolic switch towards more glycolysis. This study also supports FLIM being used to probe microglial metabolism *in situ* to better understand other NDs.

Adolescent medicine and behavior development IV

Concurrent session

10:05 AM

Saturday, January 30, 2021

220

SCREENING FOR AND DIAGNOSING MALNUTRITION IN HOSPITALIZED PEDIATRIC PATIENTS

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Purpose of Study Malnutrition is often underdiagnosed, and consequently undertreated, in hospitalized patients. A nationwide study is being conducted to validate indicators (the Malnutrition Clinical Characteristics [MCC]) to diagnose malnutrition in hospitalized patients.

Methods Used For the full study, sixty pediatric hospitals will collect patient medical history, patient STRONGKids malnutrition screening score, and nutrition intervention data. Six hundred pediatric patients will be randomly selected from the cohort to be assessed for the MCC and the Nutrition Focused Physical Exam (NFPE). Medical outcomes will be collected for all patients for a three-month period thereafter. Baseline data from a subset of sites that have started data collection were descriptively analyzed using Stata 15.

Summary of Results As of August 2020, 113 pediatric patients are enrolled in the study, with 50 children ages 1–24 months and 63 children and adolescents ages 2–17. Based on the STRONGkids screener, 73% (n = 82) of participants were ‘at

risk’ for malnutrition. A higher proportion of participants in the older age group screened at risk (n=54; 86%) compared to the younger group (n=28; 56%). Fifty-seven of the 113 participants were included in the MCC subgroup, of whom 35 (61%) screened at-risk for malnutrition. Based on the MCC criteria, 49% (n = 28) were diagnosed with malnutrition. Inadequate nutrient intake was the MCC indicator most often used to support a malnutrition diagnosis in younger participants, while weight loss was the most commonly used indicator for older participants. Across both age groups, muscle wasting and subcutaneous fat loss were the most commonly reported NFPE indicators that further supported a malnutrition diagnosis.

Conclusions Screening-based risk for malnutrition and malnutrition indicators differ for infants and young children compared to older children and teens. Differences in risk factors for malnutrition by age group and the validity of the MCC will be further assessed as more data are collected.

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IDENTIFYING GAPS IN SEXUAL HEALTH CARE AND BARRIERS TO PROVIDING RECOMMENDED CARE TO ADOLESCENTS AT AN ACADEMIC PRIMARY CARE CLINIC

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Purpose of Study We assessed the level of adherence to recommended sexual health care practices for adolescents at our institution’s general pediatrics clinic and explored provider perspectives on barriers to the delivery of recommended sexual health care to adolescents.

Methods Used We reviewed EHR data for patients ages 15–20 years who presented for preventative care at our clinic between 7/1/19 and 9/30/19. The following elements were assessed: documentation of sexual activity status, discussion of pregnancy prevention, and STI screening among those who were sexually active. We then surveyed physicians in our practice to explore potential barriers to the delivery of recommended sexual health care to adolescents.

Summary of Results The majority of patients (95%) had sexual activity status documented somewhere in the EHR; however, less than one quarter (23%) of patients had sexual activity status documented in the sexual activity tab in EHR. Most patients had sexual activity status documented in the provider note (82%) and/or in the scanned ‘staying healthy’ form (74%) found through the media tab. Additionally, most teens had some documentation of pregnancy prevention counseling (95%), but for the majority this documentation consisted of standardized language in the provider note (52%) and/or after-visit summary (56%). Only 15% had patient-specific language in the provider note, and only 5% had patient-specific language in the AVS. Less than half of sexually active teens had HIV (42%) or chlamydia (9%) tests ordered.

Provider surveys were sent to 20 resident and 19 attending physicians. Overall response rate was 82%. Confidentiality concerns were the primary reason providers cited for not documenting patient-specific sexual health information in after-visit summaries (81%) and for not ordering STI screening, including concerns about parents seeing the test on insurance bills (66%) or after-visit summaries (56%).

Conclusions At our academic primary care clinic, documentation of patient-specific sexual health counseling and ordering of recommended STI screening are occurring at suboptimal rates due primarily to concerns about patient confidentiality. These data will inform our QI efforts to improve teen care.

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SEX DIFFERENCES IN PRENATAL EXPOSURE TO MATERNAL OBESITY AND BREASTFEEDING ON CARDIOMETABOLIC MARKERS IN CHILDREN

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Purpose of Study Prenatal exposure to maternal obesity has been linked to increased risk of cardiometabolic disease, whereas breastfeeding may have beneficial effects. Emerging data suggest that prenatal exposures may have sex-specific effects. We investigated overall and sex-specific associations between maternal pre-pregnancy BMI and breastfeeding exposures on cardiometabolic risk markers in childhood.

Methods Used Data includes 160 children (64 boys) ages 7–10 born to mothers with a range of pre-pregnancy BMI. Breastfeeding duration and measures of systolic and diastolic blood pressure (SBP; DBP), height, weight, %body fat, waist and hip circumference were obtained at in-person visits. Multiple regression analysis was used to assess associations between maternal pre-pregnancy BMI and breastfeeding exposures on cardiometabolic outcomes in childhood. Models were unadjusted or adjusted for child age, sex (in full cohort), BMI-z, maternal diabetes, and SES.

Summary of Results In the full cohort, maternal pre-pregnancy BMI was associated with elevated cardiometabolic markers in unadjusted models (BMI-z: $\beta=0.03$, $p=0.01$; % body fat: $\beta=0.018$, $p=0.05$; waist to height ratio (WHR): $\beta=0.002$, $p=0.002$; SBP: $\beta=0.11$, $p=0.26$; DBP: $\beta=0.10$, $p=0.19$). Breastfeeding was marginally associated with decreased BP (SPB: $\beta=-0.13$, $p=0.12$; DBP: $\beta=-0.11$, $p=0.07$), but not other outcomes. Adjusting for co-variables attenuated the associations. In the sex-stratified analyses, among girls, maternal pre-pregnancy BMI was associated with elevated cardiometabolic markers in unadjusted (data not shown) and adjusted models (SBP: $\beta=0.25$, $p=0.05$; DBP: $\beta=0.21$, $p=0.02$; BMI-z: $\beta=0.05$, $p=0.01$; %body fat: $\beta=0.03$, $p=0.04$; WHR: $\beta=0.004$, $p=0.001$); breastfeeding > 6 months was associated with lower SBP ($\beta=-0.20$, $p=0.04$) and lower DBP ($\beta=-0.12$, $p=0.07$) but was attenuated in the adjusted model (SPB: $\beta=-0.13$, $p=0.10$; DBP: $\beta=-0.10$, $p=0.09$). Neither exposure was associated with cardiometabolic markers in boys.

Conclusions Sex-specific observations point to a greater sensitivity to early-life exposures on cardiometabolic outcomes in girls.

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TARGETING GUN VIOLENCE, IMPROVING SCREENING FOR ACCESS TO FIREARMS IN EMERGENCY DEPARTMENT PEDIATRIC PSYCHIATRIC PATIENTS

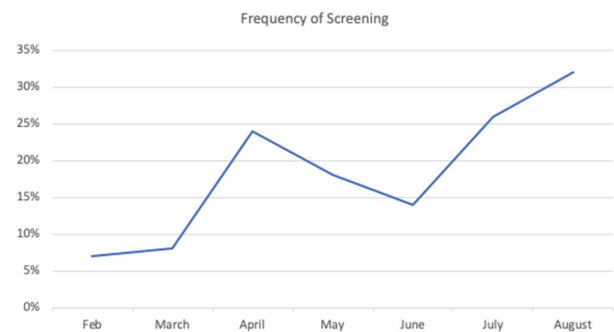
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10.1136/jim-2021-WRMC.222

Purpose of Study Increase the frequency and documentation of provider screening for access to firearms amongst pediatric psychiatric patients presenting to the emergency department. Goal to increase screening rates by 50% in 3 months, as well as increase interventions made for positive screens to educate families on safe firearm storage.

Methods Used This is a resident driven quality improvement project in a pediatric emergency department setting. We collected baseline data of firearm screening rates with a retrospective chart review of patients (N=340) who presented to the Shawn Jenkins Pediatric ED with the chief complaint of 'psychiatric evaluation'. Intervention made on 7/1 included education to residents about the project, as well as BeSmart training, BeSmart materials in the ED, the creation of a smart phrase to use in notes with reminders on desktop computers, and gun locks to distribute. Chart reviews were conducted monthly to determine frequency of firearm screening and what interventions were made for positive screens (total N=477).

Summary of Results The baseline mean rate of monthly firearm screening prior to our first intervention was 14.38%. After our first intervention with implementation of a dot phrase with resident education and distribution of BeSmart materials, firearm screening rates for the months of August and September increased to 25.8% and 32.4% respectively. Amongst providers, we found a clinically, but not significantly, difference between screening rates conducted by pediatric residents compared to others (ie EM, FM, and NP).



Abstract 223 Figure 1

Conclusions We have significant room for improvement in our rates of firearm screening. We will continue to work towards improving this rate as it is our responsibility as healthcare providers to screen and counsel on safe firearm storage.

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THE EPIDEMIC OF STRESS AND ANXIETY AMONG TODAY'S HIGH SCHOOL STUDENTS: DO STUDENTS NEED A 'LIFE' CLASS?

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Purpose of Study Stress and anxiety are an ever-growing epidemic among today's youth, especially for those located in impoverished communities where adverse childhood experiences are abundant. Although school districts have responded by placing therapists into schools to respond to mental health

crises, there have not yet been consistent efforts put into place to help students build resilience to stress. A group of high school students participating in the first ever Fresno County Youth Health Corps thus surveyed students in their own school about stress before proposing a student-led solution to this problem.

Methods Used 4 students at an impoverished high school in Fresno conducted an online survey distributed to all students at their school, and conducted interviews with a high school counselor and the Fresno County Department of Public Health Assistant Director about the causes of stress in high school students and what schools could do to mitigate these effects.

Summary of Results Of 1,017 students responding, 74% felt that school was their leading cause of stress, with 62% enrolled in at least 3 AP classes per semester and 25% enrolled in 6–7 AP classes per semester. 88% of students felt pressure to succeed in school, 65% felt overwhelmed by the amount of homework assigned, and 71% often felt drained or tired. The majority of the remaining students felt that their stress originated primarily from their personal lives, but only 20% of students felt comfortable about sharing personal issues with a counselor, teacher, or coach, with these findings confirmed by the school counselor. Student takeaway messages from the Fresno County Department of Public Health interview included the following: 1) ‘Identify the problem before it becomes too late’, 2) ‘Lessen the stigma of talking about stress’, and 3) ‘Make it easier for students to be helped’.

Conclusions Results from the above survey indicate that students are overwhelmed by stress and anxiety. As high school students, we would propose that all high schools implement a mandatory hour-long monthly Mental Health Advocacy (or LIFE) class to help students build resilience to stress and anxiety while serving as a safe place for students to talk about their problems or providing students with time to simply de-stress.

225 PATIENT/PARENT ADMINISTERED EPINEPHRINE IN ACUTE ANAPHYLAXIS

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Purpose of Study The purpose of this study was to investigate the rate of and factors associated with immediate patient/parent epinephrine administration in cases of anaphylaxis.

Methods Used The electronic medical records of patients from 217 encounters (143 of these being pediatric encounters)—either with an ED diagnosis of peanut anaphylaxis or diagnosis of anaphylaxis with a known epinephrine prescription from 2010 through May 2020—were reviewed for physician notes and demographic factors.

Summary of Results Epinephrine was administered on-scene by 22.6% of all anaphylaxis patients and in 25.2% of pediatric cases. Of the 6 health care professionals identified, 100% administered epinephrine on-scene. Females (32.0%) were administered epinephrine on-scene more frequently than males (19.8%; $p = 0.043$). Using multivariate analysis, the relationship between sex and rate of administration was only

significant when controlled for insurance as well as age. Rate of epinephrine administration increased from 2010 through 2019 ($p = 0.004$).

Conclusions Administration rates of 22.6% and 25.2% observed among non-physicians suggests that the majority of patients prescribed epinephrine have not used their EAI, even when presented an opportunity for application. A rate of 100% observed among physicians indicates that comfort with EAI facilitates willingness to administer on-scene. EAI can range up to \$900 in expense, thus physicians should employ EAI training devices and other educational modes in order to increase patient comfort with EAI.

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‘HOW DO YOU SEE YOURSELF?’: APPLYING YOUTH-DEFINED MENTAL HEALTH DOMAINS TO SUPPORT THE BALANCE OF MENTAL HEALTH AND ACADEMICS

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10.1136/jim-2021-WRMC.225

Purpose of Study Current definitions of mental health in youth recognize the interrelated nature of various domains, including social, psychological, and cognitive factors. Further investigation into how youth themselves define mental health can help identify the most effective domains to target through efforts that emphasize youth engagement. UC Davis medical students and the UCSF Fresno Department of Pediatrics partnered with sophomore students at Design Science Middle College High School in Fresno, CA, with the aim to understand what youth perceive as important mental health domains in order to guide interventions for mental health promotion.

Methods Used A needs assessment was performed utilizing Photovoice to identify youth mental health concerns. Students were asked to share photos that represented ‘How do you see yourself?’ and ‘How do others see you?’ Reflections were gathered on what students would change about these representations. An anonymous survey gathered additional perspectives on themes from the needs assessment.

Summary of Results Initial survey results revealed that students reported low confidence in their time management and study skills, followed by their abilities to understand different coping skills to deal with stress and access different mental health resources. Common themes influencing mental health were identified, with a primary focus on the domain of academics. Themes included how to achieve higher education, develop study strategies, manage stress, recognize healthy relationships, respect the diversity of others, and create positive community change. As a result of the above, a longitudinal workshop series was developed with high school student input to address youth-identified needs, with co-educators including the youth themselves, pediatric residents, and community partners.

Conclusions Students emphasized academic concerns as a primary influence on mental health, as well as intrapersonal and interpersonal factors. With a youth as partner approach, longitudinal community engagement interventions can be developed that address student-identified needs and amplify student-led efforts in order to encourage a healthy balance of mental health and academics.

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AN INNOVATIVE HYBRID LEARNING MODEL IN PEDIATRIC CRITICAL CARE MEDICINE DURING THE SEVERE ACUTE RESPIRATORY SYNDROME CORONAVIRUS 2 PANDEMIC

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10.1136/jim-2021-WRMC.226

Purpose of Study The disruption in undergraduate medical education due to the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) pandemic led to various modifications of traditional clerkship rotations. Models that provided an optimized, immediate learning environment were needed to establish alternative experiences. UCSF Fresno pediatric critical care faculty created a hybrid (virtual plus limited in-person) learning model in critical care medicine for medical students in order to overcome educational barriers posed by SARS-CoV-2 and continue providing a high quality learning environment.

Methods Used Critical care faculty identified essential sub-internship topics, including vascular access, electrolyte disturbances, sepsis management, cardiopulmonary medicine, neurocritical care, pharmacology, procedures, and medical literature appraisal. Students accessed the evidence-based curriculum, assignments, calendar, notifications, and real-time group discussions with peers, pediatric residents, and faculty using a free application (Canvas Student[®] by Instructure) on a mobile device or computer.

Summary of Results A 4-week hybrid pediatric critical care curriculum was successfully implemented during the pandemic using a free learning management system. This model combined virtual and limited daily in-person clinical activities in compliance with SARS-CoV-2 prevention guidelines. Learning topics were explored daily with faculty and residents and through self-directed student learning, while reducing unnecessary clinical area exposure. Students participated in virtual patient sign-out and limited multidisciplinary family-centered rounds, observed procedures, attended lectures, led presentations, and received a virtual evaluation.

Conclusions When the in-person learning experience is severely limited, a hybrid virtual learning environment can be an effective alternative to optimize undergraduate medical education without limiting student engagement. This model has the potential to supplement traditional rotations while providing a framework for future medical education disruptions. A hybrid learning format can be beneficial in other areas of medicine in addition to critical care. Future directions for this model should include real-time simulation-based education.

Cardiovascular II

Concurrent session

10:05 AM

Saturday, January 30, 2021

228

METFORMIN IMPROVES LEFT VENTRICULAR SIZE AND FUNCTION IN ADOLESCENTS WITH TYPE 1 DIABETES

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10.1136/jim-2021-WRMC.227

Purpose of Study People with type 1 diabetes (T1D) have higher rates of cardiovascular disease (CVD) despite modern advances in glucose control. While insulin resistance (IR) in type 2 diabetes (T2D) is known to relate to cardiovascular disease (CVD), less is understood about IR in T1D-related CVD. We previously showed vascular dysfunction and cardiac dysfunction, including left ventricular (LV) dyssynchrony, in adolescents with T1D, and in the Effects of Metformin on Cardiovascular Function in Adolescents With Type 1 Diabetes (EMERALD) study showed that metformin improves BMI, body composition, insulin dose, arterial stiffness, and carotid intimal media thickness in these T1D adolescents. We hypothesized that metformin, with insulin-sparing effects, improves CV function measured by echocardiogram, a commonly used clinical measure.

Methods Used 49 T1D youth ages 12–21 years (mean age 16.8 ± 2.5 years, HbA1c $8.6 \pm 1.5\%$, BMI 25.1 ± 4.3 kg/m², diabetes duration 7.7 ± 4.2 years) in the EMERALD study were randomized to 3 months of either 2000 mg of metformin daily or placebo. Echocardiograms with speckle tracking to evaluate traditional echocardiographic measures and cardiac strain were performed in 43 participants at baseline and 3 months. One-way ANOVA and paired t-tests were utilized to analyze whether metformin usage had significant impacts.

Summary of Results LV diameter (4.45 ± 0.47 vs. 4.26 ± 0.50 cm, $p = 0.019$) at end-diastole and at end-systole (2.89 ± 0.39 vs. 2.69 ± 0.36 cm, $p = 0.022$) and LV dyssynchrony (98.0 ± 36.9 vs. 81.7 ± 27.5 milliseconds, $p = 0.014$) showed significant improvement within the metformin group. Aortic root diameter (2.51 ± 0.39 vs. 2.73 ± 0.28 cm, $p = 0.042$) was also significantly lower in the metformin vs. placebo group post-treatment.

Conclusions Metformin may be beneficial in improving or reversing early cardiovascular changes in T1D. A better understanding of T1D-related CVD and the benefits of improving insulin action in T1D longer-term should be investigated further as a target for new treatment modalities.

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OUTCOME OF THE DEVELOPMENT OF RESTRICTIVE PHYSIOLOGY AFTER HEART TRANSPLANTATION

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10.1136/jim-2021-WRMC.228

Purpose of Study Cardiac allograft vasculopathy (CAV) is one of the major factors limiting long-term survival. A severe form of CAV is small vessel disease which results in restrictive cardiac physiology (RCP). This RCP causes a very stiff heart which leads to significant reduction in cardiac index and elevation of cardiac pressures. The pathophysiology behind this RCP is most likely due to small vessel CAV with scarring and fibrosis. The outcome of patients with this RCP has not been well established.

Methods Used Between 2010 and 2017, we assessed 23 heart transplant patients who developed RCP defined by right atrial pressure ≥ 15 mmHg, pulmonary artery diastolic pressure ≥ 15 mmHg, pulmonary capillary wedge ≥ 15 mmHg, and cardiac index ≤ 2.2 mm. Subsequent outcomes after diagnosis of RCP were 3-year survival, freedom from CAV (angiographic stenosis $>30\%$), non-fatal major adverse cardiac events (NF-

Abstract 229 Table 1

| Subsequent Endpoints | Restrictive Physiology (n=23) | No Restrictive Physiology (n=46) | P-value |
|--------------------------------------|-------------------------------|----------------------------------|---------|
| 3-Year Survival | 43.5% | 97.8% | <0.001 |
| 3-Year Freedom from CAV | 65.2% | 95.7% | <0.001 |
| 3-Year Freedom from NF-MACE | 69.6% | 100.0% | <0.001 |
| 3-Year Freedom from Hospitalizations | 78.3% | 93.5% | 0.047 |
| 1-Year Freedom from DSA | 60.9% | 93.5% | <0.001 |
| 1-Year Freedom from ACR | 73.9% | 100.0% | <0.001 |

MACE: MI, new CHF, PCI, ICD implant, stroke), development of donor-specific antibodies (DSA), and re-hospitalizations. 1-year freedom from acute cellular rejection (ACR) was also assessed as risk factor for the development of RCP. The study group was compared with a case-controlled group 2:1 matched by age, gender, and era.

Summary of Results The average time from transplant to the diagnosis of RCP was 1.5 ± 1.4 years. The RCP group compared to control had significantly lower 3-year survival and 3-year freedom from CAV, NF-MACE, and hospitalizations. There were also lower 1-year freedom from cellular rejection episodes and DSA in the RCP group compared to control.

Conclusions Heart transplant patients who develop RCP appear to have significantly reduced survival. ACR and DSA are associated with the development of RCP. As these patients do not appear to have a reversible cause, these patients may be assessed for re-transplantation if appropriate.

230 LONG-TERM EFFECTS OF MONOTHERAPY WITH LOW DOSE TACROLIMUS

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10.1136/jim-2021-WRMC.229

Purpose of Study Monotherapy with tacrolimus alone (TAC-A) was found to be safe and effective in the TICTAC Trial. However, in that trial, tacrolimus levels were maintained at 10–12 ng/mL over the first year which resulted in a higher serum creatinine level compared to those left in combination. We have been using TAC-A in patients who have developed leukopenia or thrombocytopenia due to immunosuppression or a natural state. The presence of cytomegalovirus infections and other viruses excluded those patients from being administered monotherapy. It has not been established whether TAC-A is safe and effective.

Methods Used Between 2010 and 2017, we assessed 151 heart transplant patients who are maintained on monotherapy with TAC-A. Patients were maintained on a low level of TAC-A between 4–7 ng/ml. These patients were assessed for subsequent 1-year rejection, subsequent 3-year survival, 3-year freedom from non-fatal major adverse cardiac events (NF-MACE: MI, new CHF, PCI, ICD implant, stroke), cardiac allograft vasculopathy (CAV, epicardial disease with angiographic stenosis >30%), and cardiac dysfunction (LVEF \leq 40%). Furthermore, periodic testing was done with the T-cell immune

Abstract 230 Table 1

| Subsequent Endpoints | Tacrolimus Monotherapy (n=148) | Tacrolimus + MMF (n=77) | P-value |
|---|--------------------------------|-------------------------|---------|
| 3-Year Survival | 90.5% | 89.6% | 0.789 |
| 3-Year Freedom from CAV | 89.2% | 84.4% | 0.300 |
| 3-Year Freedom from NF-MACE | 89.9% | 89.6% | 0.896 |
| 1-Year Freedom from ATR | 96.6% | 97.4% | 0.733 |
| 1-Year Freedom from ACR | 96.6% | 98.7% | 0.352 |
| 1-Year Freedom from AMR | 98.6% | 97.3% | 0.487 |
| 3-Year Freedom from Cardiac Dysfunction | 98.6% | 98.7% | 0.972 |

function test to assess whether these patients were adequately immunosuppressed.

Summary of Results Patients who were maintained on TAC-A had comparable outcomes compared to patients left in combination immunosuppression (see table 1). The T-cell immune function test showed that these patients had adequate immunosuppression (average was 276 ng/mL with the therapeutic range being 200–550 ng/ml).

Conclusions Low dose TAC-A appears safe and effective in select patients after heart transplantation. Further studies with larger number of patients will be needed to confirm these findings.

231 APPROACH TO THE HIGHLY SENSITIZED PATIENT AWAITING HEART TRANSPLANTATION

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10.1136/jim-2021-WRMC.230

Purpose of Study Approximately 30% of patients awaiting heart transplantation develop pre-formed anti-HLA antibodies due to previous surgeries, blood transfusions, pregnancies, and previous organ transplants. Patients who are considered highly sensitized have calculated Panel Reactive Antibody (cPRA) levels \geq 80%. We reviewed our highly sensitized patients who are awaiting heart transplantation to assess effect of desensitization therapy.

Methods Used Between 2010 and 2019, we assessed 85 patients who are awaiting heart transplant who had a cPRA \geq 80%. These patients were given desensitization therapy and were divided into those that received intravenous immunoglobulin (IVIg) alone, rituximab-based therapy, plasmapheresis (PE) alone, bortezomib-based therapy, and finally combination therapy with rituximab/bortezomib-based therapies. cPRAs and immunodominant antibody strength (mean fluorescent intensity, MFI) were obtained before and after treatment.

Summary of Results Desensitization with rituximab- and bortezomib-based therapies appeared most effective in reducing cPRA. Treatment response also appeared to be dependent on class of antibodies, whereas Class I were generally responsive to all therapies and Class II were less so but only to rituximab/bortezomib therapies. All of these patients underwent successful heart transplantation although DSA were crossed at the time of surgery.

Abstract 231 Table 1

| Endpoint | IVIG (N=18) | Rituximab-based (N=5) | PE (N=15) | Bortezomib-based (N=30) | Combination with rituximab/ bortezomib-based (N=10) | P-value |
|--|----------------|--------------------------|--------------|----------------------------|---|---------|
| Pre-treatment cPRA | 54.5 ± 36.2 | 87.8 ± 17.5 | 63.9 ± 34.3 | 87.5 ± 11.7 | 89.5 ± 9.3 | <0.001 |
| Post-treatment cPRA | 70.7 ± 31.8 | 75.8 ± 14.7 | 71.3 ± 34.1 | 79.0 ± 22.8 | 87.2 ± 8.5 | 0.516 |
| Change in cPRA Post-treatment | 12.9 ± 24.1 | -12.0 ± 12.9 | 6.0 ± 43.4 | -8.5 ± 19.8 | -2.3 ± 6.2 | 0.060 |
| Change in Class I Antibodies | -1718 ± 3652 | -4338 ± 2513 | -4059 ± 4496 | -3451 ± 3435 | -1958 ± 1976 | 0.394 |
| Change in Class II Antibodies | 213 ± 2944 | -2187 ± 3093 | 626 ± 5243 | -856 ± 3072 | -913 ± 1608 | 0.730 |
| Overall Change in Antibodies (Class I and Class II) | -522 ± 3011 | -3339 ± 2803 | -2392 ± 5706 | -1830 ± 3412 | -1428 ± 1861 | 0.527 |

Conclusions Highly sensitized patients respond to desensitization therapies, with specific treatments proving more beneficial depending on the class of antibodies detected. Desensitization therapies enable these highly sensitized patients to undergo successful heart transplantation.

232 GENETIC DETERMINANTS OF VARIABLE EXPRESSIVITY OF OBSTRUCTIVE LEFT HEART DISEASE

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10.1136/jim-2021-WRMC.231

Purpose of Study Bicuspid aortic valve (BAV) is the most common congenital heart defect yet the exact cause is unclear. Multiple genes have been implicated and evidence suggests an autosomal dominant (AD) inheritance with reduced penetrance. Some experts believe obstructive left heart disease may be a spectrum where BAV is mild and hypoplastic left heart syndrome (HLHS) is severe. This study explores the genetic determinants responsible for phenotypic variance in obstructive left heart disease by examining exomes of a family with BAV and HLHS. The father and brother have BAV, one sister has HLHS, one sister is unaffected and the mother is presumed unaffected.

Methods Used Whole exome sequencing data was obtained on the affected and unaffected family members. Raw data was processed using the Galaxy web platform. The remaining analyses were performed using National Center for Biotechnology Information tools including Genome Data Viewer to assess variants by mutation type, dbGaP to review allele frequency (>15% were excluded) and ClinVar to determine clinical significance of identified variants.

Summary of Results The father, brother and sister have an AD disruptive 3bp in-frame insertion in FOXC1 (rs76840944). The father and brother have three AD variants: GATA4 missense (rs3729856, likely pathogenic), GATA4 intron (rs10503425, conflicting interpretation of pathology), EGFR 3'UTR (rs17337528). The sister has de-novo heterozygous NEXN frameshift and MYH6 missense variants. Only the GATA4 variants were in ClinVar.

Conclusions The observed phenotypes are likely due to separate variants rather than the hypothesized spectrum of disease. Of those described, the GATA4 variants are likely responsible for BAV while MYH6 contributed to HLHS. The GATA4 missense mutation was previously reported as likely pathogenic and literature shows noncoding variants near

GATA4 may lead to increased penetrance. MYH6 variants cause decreased contractility and dystrophic sarcomere structure that may contribute to HLHS. This in-depth analysis highlights the complexity of BAV genetics and the spectrum of familial obstructive left heart lesions. Study limitations include lack of comparative data from the unaffected sister and unknown history of the mother. We will follow-up with data for the unaffected sister to aid in familial variant analysis.

233 EFFECT OF SLEEP APNEA ON ATRIAL ARRHYTHMIA RECURRENCE RATES AFTER ABLATION

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10.1136/jim-2021-WRMC.232

Purpose of Study Obstructive sleep apnea (OSA) is a risk factor for both atrial fibrillation (AF) and atrial flutter (AFL). Non-pulmonary triggers have been described in patients with OSA. The objective of this study is to compare the rate of recurrence of AF and AFL after different ablation techniques in patients with and without OSA.

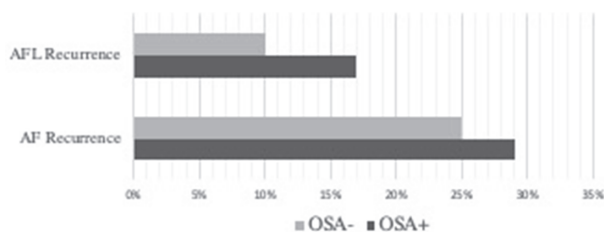
Methods Used We retrospectively analyzed 219 patients who had ablations at our center. We compared the effect of ablation on recurrence of AF and AFL at one year in patients with and without documented sleep apnea. We also analyzed the posterior wall area (PWA) and effect of posterior wall isolation (PWI) vs conventional ablation (CA) at pulmonary veins, on clinical outcomes.

Summary of Results Our study included 219 patients (table 1); patients with OSA were more likely to have persistent atrial fibrillation (70% vs 50%) (p = 0.007). There was a trend towards higher recurrence of both AF (29% vs 25%) and AFL (17% vs 10%) at one year after CA in OSA patients (figure 1). In the subset of patients undergoing PWI, there was no significant difference in PWA measured between roof and floor lines by CT scan among the patients with and without OSA (18.2 cm² vs 18.3 cm², ns). In patients with OSA, AF recurrence in patients who had PWI was 25.6% vs 33.3% (ns) in CA. In patients without OSA, AF recurrence was 17% in those that received PWI vs 30% (p=0.09) in CA (figure 2).

Conclusions In our study, we found a trend towards higher recurrence rates of AF and AFL after conventional ablation in patients with OSA. PWI appears to be more effective in those

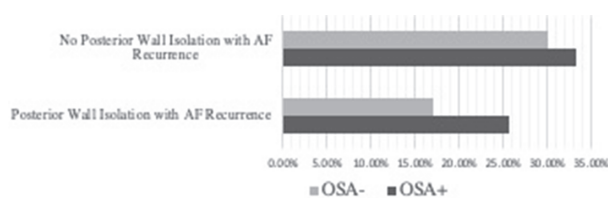
Abstract 233 Table 1 Baseline characteristics for entire cohort. N = 219

| | |
|--------------------|-------------|
| Age (years) | 64.2 ± 10.3 |
| Sex (Female %) | 55 |
| OSA+ (patient #) | 64 |
| OSA- (patient #) | 155 |
| Hypertension (%) | 69 |
| Diabetes (%) | 22 |
| CVD (%) | 23 |
| Stroke/TIA (%) | 12.8 |
| CHADS 2 VASC Score | 2.4 ± 1.5 |
| BMI | 30 ± 5.2 |
| Heart Failure (%) | 25 |



Abstract 233 Figure 1 AF and AFL Recurrence in OSA+ vs OSA- Following Conventional Ablation

AFL and AF Recurrence values were compared in OSA+ (n = 64) vs OSA (n = 155) patients following 1 year after conventional ablation. AF recurrence was 29% (OSA+) vs 25% (OSA-) (p = ns). AFL recurrence was 17% (OSA+) vs 10% (OSA-) (p = ns)



Abstract 233 Figure 2 AF Recurrence in OSA+ and OSA-. Patients Following Posterior Wall Isolation and Conventional Ablation

AF recurrence was compared 1 year following posterior wall isolation (PWI) VS Conventional Ablation in OSA+ patients and OSA- patients. AF recurrence in the OSA- group (n = 55) was 17% with PWI vs 30% w/ Conventional Ablation (p = 0.09). AF recurrence in the OSA+ group (n = 5) was 25.60% with PWI vs 33.30% w/ Conventional Ablation (p = ns)

without OSA than those with OSA. Further investigation for non-pulmonary triggers in this subgroup are needed.

234 REFINED METHODS FOR TRANSCRIPTOME ANALYSIS IN ISCHEMIC CARDIOMYOPATHY

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10.1136/jim-2021-WRMC.233

Purpose of Study Sweet et al. (2018) reports that severity of heart failure (HF) symptoms and left ventricular dysfunction determine current HF treatment. An approach based on underlying biology may ultimately facilitate a precision medicine approach to HF^{[1],[2]}. Using the same data from this 2018 study, we developed a novel modification for bioinformatic analysis of differentially expressed genes (DEG's) between ischemic cardiomyopathy (ICM) and non-failing (NF) heart tissue. Our process also permitted easy adjustment of statistical parameters in DEG analysis of this and other datasets.

Methods Used RNA-seq from 13 ICM and 14 NF control human left ventricular samples with expression data for 57974 genes. Matlab analysis began with purging data of missing and nonsensical entries. We replicated the analysis of Sweet et al. and also adjusted threshold stringency for a) fold-change and b) mean absolute change between ICM and NF gene expression levels to identify smaller, more focused DEG sets. We will also present results of bioinformatic validation testing on a newly generated human heart tissue transcriptome dataset.

Summary of Results Using the DEG cutoff conditions of the 2018 study, we closely replicated its gene list. With various cutoff conditions for mean and fold-change, we produced narrower DEG lists for joint pathway analysis with corresponding metabolomic data. Applying the same algorithm to a new, larger dataset will test repeatability.

Conclusions Our bioinformatic pipeline provides for flexible adjustment of DEG identification parameters, allowing for tailored generation of DEG lists. Joint pathway analysis incorporating metabolomic data adds another dimension for discovering the underlying biology of HF due to ICM.

235 BYSTANDER CPR AND VENTRICULAR FIBRILLATION WAVEFORM MEASURES IN OUT-OF-HOSPITAL CARDIAC ARREST

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10.1136/jim-2021-WRMC.234

Purpose of Study Bystander CPR (BCPR) is associated with improved survival after out-of-hospital cardiac arrest (OHCA). The mechanism of this benefit is not clear. We used Amplitude Spectrum Area (AMSA), a quantitative measure of the ventricular fibrillation (VF) ECG, as a surrogate for myocardial physiology to investigate the mechanism by which BCPR improves survival.

Methods Used We conducted a retrospective cohort study of witnessed OHCA cases presenting with an initial rhythm of VF in a metropolitan EMS system between 2005–2018. Defibrillator recordings were annotated for rhythm and CPR. The AMSA waveform measure was calculated from the first available 3-s ECG segment without CPR prior to initial shock. Utstein elements including witnessed status, BCPR provision, and survival to discharge were ascertained from

Abstract 235 Table 1 VF Waveform and Outcome Characteristics by Bystander CPR Status

| | Bystander CPR (n = 814) | No Bystander CPR (n=258) | P Value |
|---|----------------------------|-----------------------------|---------|
| AMSA, median (IQR) | 9.8 mV-Hz (6.6, 13.5) | 7.5 mV-Hz (4.6, 11.0) | <0.01 |
| ROSC at end of EMS care, n (%) | 472 (58) | 143 (55) | 0.51 |
| Admit to hospital, n (%) | 612 (75) | 176 (68) | 0.03 |
| Survive to discharge, n (%) | 425 (52) | 110 (43) | <0.01 |
| Survival with cerebral performance category 1 or 2, n (%) | 392 (48) | 96 (37) | <0.01 |

the OHCA registry. Median AMSA according to BCPR status was compared with the Wilcoxon rank-sum test. We performed logistic regression and model-based causal mediation analyses to evaluate the associations between BCPR, AMSA, and survival.

Summary of Results Of 1072 eligible patients, AMSA, survival and neurologic outcome were significantly greater in 814 patients who received BCPR compared to 258 patients who did not ($p < 0.01$, table 1). In the multivariable logistic model adjusted for Utstein variables, BCPR was associated with an increased odds of survival (OR=1.6 [95% CI: 1.2, 2.1]). The odds ratio between BCPR and survival was attenuated by addition of AMSA to the model, and no longer statistically significant (OR=1.3 [95% CI: 0.92, 1.7]). Model-based mediation analysis indicated that AMSA mediated 53% ($p < 0.01$) of the association between BCPR and survival.

Conclusions BCPR is associated with greater AMSA and survival. Furthermore, AMSA appears to mediate over half of the survival benefit associated with BCPR. These findings support a myocardial mechanism by which BCPR improves survival after OHCA.

Healthcare research IV – psychology

Concurrent session

10:05 AM

Saturday, January 30, 2021

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ARE MALES AND FEMALES ALIKE? THE ROLE OF CENTRAL SENSITIZATION IN PATIENTS WITH CHRONIC ROTATOR CUFF TEARS

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Purpose of Study Women have a higher prevalence of chronic pain conditions, partially explained by presence of central sensitization (CS). In CS, pain sensitivity increases across the body. Evidence suggests CS may play a role in persistent musculoskeletal pain; and up to 30% of individuals with shoulder pain demonstrate CS. This study determined if outcomes of a

physical therapy exercise program were influenced by CS or sex in patients with shoulder pain.

Methods Used In a longitudinal study, 11 patients with full-thickness rotator cuff (RC) tears (5 male, 66 ± 7 years of age) were examined pre and post 12 sessions of strength and aerobic exercise over 8 weeks. We measured pressure pain threshold (PPT) over the tibialis anterior - distal from the injury and a marker of CS. A group of sex-matched healthy control (HC, 64 ± 6 years of age) was recruited. CS was assessed as the difference between RC and HC groups via the mean difference (MD) with 95% confidence interval (CI₉₅). Recovery in the RC group was assessed via the Penn shoulder score (function subscore), reporting change over the intervention as MD and CI₉₅. These analyses were stratified by sex.

Summary of Results Males demonstrated lower PPT versus control at baseline, whereas females did not (table 1). Post-intervention, females demonstrated larger clinically meaningful improvements in shoulder function compared to males (table 2).

Abstract 236 Table 1

| Variable | Sex | Mean Difference (HC-RC group) | 95% CI |
|------------------------------|--------|----------------------------------|-------------|
| PPT at Tibialis Anterior, Kg | Male | 2.5 | [-.97, 10] |
| | Female | 0.6 | [-2.5, 3.7] |

Abstract 236 Table 2

| Variable | Sex | Mean Difference over time (post-pre) | 95% CI |
|---|---------|---|-------------|
| Penn Function (0–60, 60 full function) | Males | 2.8 | [-2.7, 8.4] |
| | Females | 11 | [1.6, 2.1] |

Conclusions At baseline males with RC tears had lower PPT indicating CS. After intervention, males exhibited less treatment benefit compared to females. These results are in line with prior data demonstrating lower PPT with poorer outcomes, although our study uniquely identified males as centrally sensitized in contrast to classic understanding of pain. Despite small sample size, these data suggest classic assumptions of CS in female patients may not hold for patients with chronic RC related shoulder pain.

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SUBSTANCE USE AND MENTAL HEALTH COMORBIDITIES AMONG PATIENTS IN A LOW-BARRIER HIV CLINIC

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10.1136/jim-2021-WRMC.236

Purpose of Study Untreated psychiatric and substance use disorders can pose barriers to HIV treatment success. We evaluated the prevalence of and treatment receipt for psychiatric and

substance use diagnoses in the Max Clinic, a novel low-barrier HIV clinic for people with complex needs, in order to inform service improvement.

Methods Used We reviewed the electronic medical records of persons enrolled December 2014 - June 2020, excluding those enrolled for <1 month. We used text notes and diagnosis codes to identify, at enrollment, substance use and injection drug use in the past year, housing status, and prior psychiatric diagnoses. Among patients with substance use or psychiatric diagnoses, we reviewed treatment at enrollment, medications prescribed in the Max Clinic, referrals to specialty care, and completed specialty visits. We conducted a descriptive analysis and examined service receipt stratified by substance type and psychiatric diagnosis, focusing on mental health treatment and medications for opioid use disorder (MOUD).

Summary of Results Of 227 total enrolled patients, 69% had a psychiatric diagnosis, including depressive (51%), anxiety (26%), psychotic (19%), and bipolar (16%) disorders. Most patients (85%) had chart-documented active substance use, including methamphetamine (60%) or heroin (30%); 42% injected drugs. Of 219 patients with a psychiatric diagnosis or substance use, 71% were living homeless or unstably housed. Of 128 patients with a psychiatric diagnosis not receiving treatment at enrollment, 46% were prescribed medications in clinic and 86% were referred to specialty care, of whom 38% completed ≥ 1 visit. Of 45 patients with chart-documented heroin use at enrollment not on MOUD, 25% were prescribed MOUD in clinic and 60% were referred for MOUD, of whom 40% completed ≥ 1 visit.

Conclusions This study identified a large unmet need for behavioral health treatment among patients enrolled in a low-barrier HIV clinic. External referral to behavioral health specialists resulted in low rates of engagement, as less than half of Max Clinic patients referred to mental health care and MOUD complete even one specialty care visit. Integrating mental health treatment and MOUD on-site is likely needed to improve patient care.

238 ADVERSE CHILDHOOD EXPERIENCES AND DEVELOPMENTAL DELAY IN YOUNG US CHILDREN

C Nivens*, A Hoyt-Austin, E Bimla Schwarz. *University of California Davis, Sacramento, CA*

10.1136/jim-2021-WRMC.237

Purpose of Study Adverse childhood experiences (ACEs) have been associated with developmental delay and poor health outcomes in late childhood and adolescence. Health promoting practices such as breastfeeding and daily reading have been associated with lower rates of developmental delay. This study aims to investigate the association between early ACE exposure, protective health behaviors, and the diagnosis of developmental delay in early childhood.

Methods Used In this cross-sectional analysis of population-representative data from the 2017–2018 National Survey of Children's Health, we examined the relationship between ACEs, prior breastfeeding, daily reading, and diagnosis of developmental delay among 7837 children aged 3–5 years, using multivariate logistic regression to adjust for family, personal (i.e. premature birth, or low birth weight), and sociodemographic characteristics.

Summary of Results We found a dose-dependent relationship between ACEs and developmental delay; compared to those

with no ACE, developmental delay was more common among those with either 1 ACE (aOR=1.57, 95% CI 1.03–2.40) or 2 or more ACEs (aOR=3.22, 95% CI 2.0–5.19). Developmental delay in this age group was also associated with very low birth weight (aOR 3.98, 95% CI 1.62–9.77) and premature birth (aOR 2.21, 95% CI 1.34–3.65). Neither breastfeeding (breastfed for 6 months versus none aOR=0.70, 95% CI 0.36–1.36) nor daily reading (no reading versus daily reading aOR=1.10, 95% CI 0.47–2.60) were associated with reduced incidence of developmental delay in study participants.

Conclusions Children with early ACEs are at risk of developmental delay, regardless of whether they are breastfed or read to on a daily basis.

239 NALOXONE AVAILABILITY THROUGHOUT CALIFORNIA

S Vyas*, A Garfinkel, E Dini, R Ozawa, V Gerriets, Z Nicolas. *California Northstate University College of Medicine, Elk Grove, CA*

10.1136/jim-2021-WRMC.238

Purpose of Study Naloxone is an opioid receptor antagonist that is administered to reverse the effects of opioid overdose. We will investigate several variables to understand how/why we see differences in naloxone availability to gain greater insight into how availability and barriers impact the opioid epidemic. As we expand our research to urban and rural areas, we expect to see a greater amount of pharmacies stock naloxone in San Francisco county compared to Sonoma County due to higher population density and implemented legislation.

Methods Used A list of pharmacies was obtained from the California State Board of Pharmacy. A phone survey was administered to pharmacists and pharmacy technicians to geographically assess and analyze naloxone availability in Sacramento county. This phone survey will be expanded to other counties.

Summary of Results Of all pharmacies contacted thus far, only 44% of pharmacies had naloxone availability in 2018. Of those pharmacies 75% carried Narcan® intranasal spray, 17.9% carried intramuscular injections, 3.6% carried Evzio® auto injector, and 3.6% carried intranasal via atomizer. Only 1 pharmacy was found to carry all 4 formulations, and 49% of pharmacies surveyed furnished naloxone without a prescription. In 2019, we saw an increase in stocking naloxone as 98% of surveyed pharmacies carrying it with 86% of those pharmacies only carrying Narcan® intranasal spray. Naloxone furnishing without a prescription in 2019 jumped to 76%.

Conclusions Our findings suggest that pharmacies have improved their strategies for naloxone use. In the surveyed areas, more than 50% of pharmacies provide an indirect barrier by not carrying naloxone in 2018. About 50% of pharmacies surveyed adhere to voluntary guidelines aimed to increase naloxone availability and limit barriers to access. When surveyed in 2019, 98% were found to carry Naloxone and pharmacies that furnished Naloxone without a prescription increased to 76%. We found that more pharmacies that stock naloxone were willing to furnish without prescription boosting protocol adherence and lowering barriers to availability. Additional data collected emphasizes pharmacies' unfamiliarity with naloxone use, protocols and guidelines. A similar growth was seen in protocol adherence and naloxone training when resurveyed with a 40% increase in training.

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ASSOCIATION BETWEEN MENTAL ILLNESS AND CARDIOVASCULAR OUTCOMES AMONG EMERGENCY DEPARTMENT PATIENTS PRESENTING WITH CHEST PAIN

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10.1136/jim-2021-WRMC.239

Purpose of Study Patients with mental illness often experience disparities in treatment that can impact health outcomes. Few studies have examined the difference in cardiovascular (CV) outcomes for emergency department (ED) patients with mental illness compared to those without. The goal of this project was to examine mental health-related disparities in acute care outcomes among Medicaid beneficiaries with an ED visit for nonspecific chest pain.

Methods Used We conducted a retrospective review of 82,807 nonspecific chest pain ED visits of Washington state adult Medicaid beneficiaries from 2010–2017. Patient exposure was determined by ICD codes that identified any mental illness and serious mental illness. Our primary outcome was the incidence of a CV hospitalization within 30 days of the index visit date. Secondary outcomes included acute myocardial infarction (AMI) within 30 days and 6 months, and CV hospitalization within 6 months. We performed multivariate logistic regressions to assess the associations between mental illness/serious mental illness and the outcomes of interest, controlling for race, gender, age, Elixhauser comorbidities, and baseline ED visits and inpatient hospitalization rates from the past year.

Summary of Results Patients with mental illness had similar odds of CV hospitalization within 30 days compared to those without mental illness (OR, 1.53; 95% CI, 0.97 to 2.44; $P = 0.070$). Patients with mental illness had increased odds for CV hospitalization within 6 months (OR, 1.60; 95% CI, 1.13 to 2.27; $P = 0.008$), and had similar odds of AMI at 30 days and 6 months compared to those without mental illness. Serious mental illness was associated with higher odds of AMI within 6 months (OR, 1.47; 95% CI, 1.00 to 2.15; $P = 0.048$).

Conclusions Neither mental illness nor serious mental illness were associated with increased odds of CV hospitalization within 30 days. However, mental illness was associated with increased odds of CV hospitalization within 6 months. Further investigation is warranted to examine the strength of this finding and the relationship between mental health, ED treatment, and short and long-term health outcomes.

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TRANSITION OF CARE FROM THE EMERGENCY DEPARTMENT FOR PATIENTS WITH OPIOID USE DISORDER

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10.1136/jim-2021-WRMC.240

Purpose of Study The Emergency Department (ED) is increasingly becoming an important site for buprenorphine initiation for patients with opioid use disorder (OUD), but barriers to continued treatment post ED-discharge remain. Transitional care clinics bridge patients to outpatient care, but little is

known about the barriers and facilitators to attendance for patients with OUD. Our study assessed the predictors of attendance at the Harborview Medical Center (HMC) After Care Clinic (ACC) for patients with OUD who visited the ED to understand how to connect these vulnerable patients to ongoing treatment.

Methods Used A retrospective study of patients prescribed or dispensed buprenorphine in the HMC ED from June 1, 2019 – June 1, 2020 and referred to the ACC. Patient and visit-level characteristics were abstracted from the medical records of these patients. Multiple logistic regression was used to identify factors associated with attendance at After Care.

Summary of Results A total of 146 patients were included in the sample, of which 44 (30.1%) attended their ACC visit. Of all 146 patients, 105 (71.9%) were un-housed, 129 (88.4%) were not employed, and 86 (58.9%) were concurrently using methamphetamine. Being un-housed (odds ratio [OR], 0.32, confidence interval [CI], 0.12 – 0.86), uninsured (OR, 0.17, CI, 0.03–1.09), and having a history of incarceration (OR, 0.28, CI, 0.10–0.77) were all negatively associated with ACC attendance. Having a cell phone (OR, 1.53, CI, 0.55–4.27), a history of a psychiatric disorder (OR, 1.89, CI, 0.75–4.76) and being treatment-seeking (OR, 1.81, CI, 0.70–4.71) were all positively associated with attendance.

Conclusions This study found that social determinants of health such as experiencing homelessness, being uninsured, and previous incarceration all present barriers to post-ED follow-up, suggesting that these patients warrant increased resources and attention to support their continued healthcare engagement.

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FACTORS ASSOCIATED WITH PAIN-RELATED HIGH-COST CARE SETTINGS IN HIDRADENITIS SUPPURATIVA

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10.1136/jim-2021-WRMC.241

Purpose of Study Hidradenitis suppurativa (HS) is a chronic inflammatory dermatosis with tender nodules, abscess, and sinus tracts in intertriginous areas. HS has been associated with recent increases in inpatient hospitalization rates. We aimed to evaluate factors affecting pain-related utilization of high-cost care (HCC) in HS.

Methods Used An anonymous online survey was sent to Facebook HS groups asking ‘In the past 12 months, have you gone to urgent care, the emergency department, or been hospitalized because of pain from HS?’ Participants selected which of 20 pain intervention therapies they have tried for HS. A rating scale (0–10) was used for baseline pain. A multivariate logistic regression model was adjusted for Hurley stage (significance $p < 0.05$). Odds ratios (OR) contain 95% confidence intervals.

Summary of Results Of the 438 participants, 93.8% were female. HCC was reported in 32.2% which included 41.7% (15/36) of those with Hurley stage I (mild), 30.8% (72/234) of stage II (moderate), and 32.1% (54/168) of stage III (severe). Those with HCC had significantly higher mean baseline pain than those who did not (4.2 vs 3.4; OR=1.11 [1.03–1.19]; $p=0.01$). Males were more likely than females to have HCCs (55.6% vs 30.7%; OR=2.86 [1.29–6.47]; $p=0.01$). Current tobacco smokers were more likely to have

HCCs than those who never smoked (40.0% vs 25.8%; OR=1.97 [1.23–3.19]; $p=0.01$). Rates of HCCs were higher in users versus nonusers for the following pain management modalities: **opioids** (51.4% vs 25.8%; OR 3.38 [2.21–5.43]; $p<0.01$), **gabapentin** (48.8% vs 30.4%; OR=2.26 [1.17–4.39]; $p=0.02$), **marijuana smoking** (44.5% vs 27.1%; OR=2.22 [1.44–3.42]; $p<0.01$), **tramadol** (44.6% vs 30.0%; OR=1.99 [1.14–3.45]; $p=0.01$), **massage therapy** (45.5% vs 30.7%; OR=1.96 [1.03–3.70]; $p=0.04$), **bleach baths** (39.5% vs 29.6%; OR=1.66 [1.04–2.66]; $p=0.03$), and **topical numbing creams** (37.6% vs 28.7%; OR=1.55 [1.02–2.34]; $p=0.04$). **Conclusions** Some HS patients require additional education on appropriate use of HCC. Pain control may reduce HCC utilization in HS patients.

243 AN ASSET-BASED APPROACH TO REDUCING OPIOID-RELATED MORTALITY AMONG THE LUMMI COMMUNITY

T Huynh*. *University of Washington School of Medicine, Seattle, WA*

10.1136/jim-2021-WRMC.242

Purpose of Study Lummi Nation is a Native American tribe of the Coast Salish peoples in Western Washington. Opioid use and opioid-related mortality disproportionately affect American Indians and Alaska Natives (AI/AN) in the Northwest, including the Lummi people. In 2016, the drug overdose death rate among AI/AN was 2.4 times that of the NW regional average, with 67% involving an opioid. The purpose of this study is to apply an asset-based approach of community development to identify potential interventions for reducing opioid-related mortality among the Lummi community.

Methods Used Individuals, institutions, and local organizations helping to reduce opioid-related mortality in the Lummi community were identified by interviewing providers and patients at a local health clinic, and through community conversations with individuals in a harm reduction program. A literature review was conducted to explore risk factors associated with opioid use among AI/AN and other possible interventions for reducing opioid-related mortality. A public health report was drafted to assess feasibility of the translation of these interventions to the Lummi community.

Summary of Results Community members and clinicians identified opioid use, overdose, and opioid use disorder as public health concerns of the Lummi community. Community assets addressing these issues included office-based opioid treatment, a crisis outreach program for those experiencing recent opioid overdose, and a peer-run community-based harm reduction program. Other assets were a buprenorphine treatment program with counseling and mental health services.

Conclusions Incorporating a strengths-based framework for community development allowed individuals to contribute their skills and social networks to the development of their community. Institutions also contributed via the development of programs serving the community. The next steps are to build upon community assets by examining the programs and support systems already in place that can help to address opioid-related mortality in the Lummi community. For instance, counseling services already established as a part of buprenorphine treatment may also be used to instate a methadone maintenance treatment program. In this way, such a

program becomes a potentially feasible and beneficial intervention for the Lummi community.

Neonatology general V

Concurrent session

10:05 AM

Saturday, January 30, 2021

244 EFFECTS OF SARS-COV-2 ON PREGNANT WOMEN AT DELIVERY AND NEONATAL OUTCOMES AT A SINGLE INSTITUTION IN LOS ANGELES

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10.1136/jim-2021-WRMC.243

Purpose of Study To evaluate the effects of SARS-CoV-2 infection on pregnant women and neonates. 2) To stratify neonatal outcomes by whether the mother was symptomatic.

Methods Used Retrospective review of data on pregnant women admitted for delivery and infants from a center serving a population of predominantly lower socioeconomic status in Los Angeles. We report descriptive statistics and bivariate analyses examining whether neonatal outcomes differed by maternal symptomatology.

Summary of Results We included 51 mother/newborn-dyads with SARS-CoV-2 positive mothers at delivery by nasopharyngeal PCR. Most mothers were Caucasian (96%) and Hispanic (96%). The majority of mothers were asymptomatic (46/51, 90%); 4(7%) were symptomatic; 1(2%) required hospitalization for COVID-19. Mothers had symptoms from 0–7 days before delivery. One mother was severely ill and required mechanical ventilation and convalescent plasma. Her infant was delivered due to worsening maternal condition. Following delivery, the mother was transferred for ECMO.

All 51 infants were inborn, liveborn, and singletons. 73% were born by vaginal delivery and 27% by C-section. Mean gestational age was 38.9 ± 1.8 weeks; 5 infants (10%) were preterm. Mean birthweight was 3161 ± 444 grams. One infant needed resuscitation with CPAP. For all but one infant, the 5-minute Apgar score was 9. 16/51 (31%) presented with respiratory distress; 6 needed supplemental oxygen; 2 needed CPAP. All neonates had SARS-CoV-2 testing by PCR of nasopharyngeal swab – 51/51 were negative at 24 hours and 43/43 were negative at 48 hours. There were no significant differences in neonatal outcomes by maternal COVID-19 symptomatology.

Conclusions The majority of SARS-CoV-2 positive mothers were asymptomatic, supporting universal testing of mothers admitted for delivery. One mother became critically ill emphasizing close monitoring of pregnant women. Even though all infants tested negative for SARS-CoV-2 reflecting the low rate of perinatal transmission almost 1/3 had transient respiratory symptoms. There was no difference in neonatal outcomes by maternal symptomatology.

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ASSESSMENT OF ULTRASOUND-GUIDED PERIPHERAL ARTERIAL LINE PLACEMENT IN INFANTS AFTER IMPLEMENTATION OF A BEDSIDE ULTRASOUND PROGRAM

R Dasani*, V Pai, S Vallandingham, C Noh, A Davis, S Bhombal. *Stanford University School of Medicine, Palo Alto, CA*

10.1136/jim-2021-WRMC.244

Purpose of Study Peripheral arterial line placement is a technically challenging procedure in infants due to small caliber vessels. Repeated unsuccessful attempts can lead to complications, increase procedure time and decrease overall success rate. In pediatric and adult populations, ultrasound-guided placement of peripheral arterial lines has been shown to improve procedural accuracy and lead to fewer attempts and complications compared to a landmark-based approach. A bedside ultrasound program was implemented in our neonatal intensive care unit (NICU) in December 2018. The purpose of this study was to assess whether use of ultrasound (US) decreased the number of peripheral arterial line attempts and increased first attempt success in infants after this program was established.

Methods Used We conducted a retrospective chart review of infants admitted to the neonatal intensive care unit (NICU) who had a successfully placed peripheral arterial line from January 2019 to July 2020 by a NICU provider. We collected demographic information, number of attempts and whether US was used. Student's t-test and chi-square test were used to compare variables between groups.

Summary of Results A total of 59 arterial lines (23 ultrasound-guided, 36 non-US guided approach) were placed on 49 patients. Ultrasound was used more frequently on larger and older infants. Lines placed by US had fewer attempts for successful placement ($p=0.01$) and resulted in higher first attempt success rates, though did not reach statistical significance.

Conclusions Following implementation of a bedside US program, use of US had fewer mean attempts for successful arterial line placement although US was used more often in older and larger infants. Further research is needed to evaluate the utility of US for arterial access in infants.

Abstract 245 Table 1

| | US-Guided (n = 23) | Non-US Guided (n = 36) | P-value |
|--------------------------------------|--------------------|------------------------|---------|
| Weight (g), mean (SD) | 3100 (1044) | 1915 (1193) | <0.001 |
| Postmenstrual age (weeks), mean (SD) | 38.4 (3.8) | 34.3 (6.3) | 0.007 |
| Number of attempts, mean (SD) | 1.4 (0.6) | 2.2 (1.4) | 0.01 |
| First attempt success, n (%) | 14 (60.9%) | 14 (38.9%) | 0.10 |

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RECONCILING MARKEDLY DISCORDANT VALUES OF SERUM FERRITIN VERSUS RETICULOCYTE HEMOGLOBIN CONTENT

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Purpose of Study The serum ferritin level is commonly used to screen neonates for iron deficiency. A more recent method used to assess iron stores is the reticulocyte hemoglobin content (RET-He), which measures the hemoglobin within reticulocytes. The RET-He serves as a metric of the iron available for hemoglobin production during the previous several days. We do not routinely measure both the serum ferritin and the RET-He. However, on rare occasions both tests are obtained simultaneously; and occasionally we observe discordant results. The purpose of this study was to determine why serum ferritin and reticulocyte hemoglobin (RET-He), drawn to assess neonatal iron sufficiency, sometimes have markedly discordant results.

Methods Used We assembled a data set from laboratory tests obtained in five NICUs over 28 months, identifying all patients with a ferritin and RET-He drawn simultaneously (within 48 hours of each other). We compared the group with concordant ferritin and RET-He values, with the group where results of the two tests were discordant. We considered *significant* discordance if one value was >95th% reference interval, while the other was <5th%, and we sought explanations for these.

Summary of Results Of 190 paired ferritin and RET-He measurements, 16 (8%) were *significantly* discordant. Fifteen of the 16 involved a high ferritin and a low RET-He. These 15 had a higher immature to total neutrophil ratios ($P=0.008$) and a higher CRP than did those with concordant values ($P<0.001$). Eight of the 15 also had clinical evidence of an inflammatory process and five others had suspicion of infection. In these 15, a low MCV and a high %Micro-R, and a low MCH and a high%HYPO-He suggested iron deficiency.

Conclusions When ferritin and RET-He were discordant, inflammation likely cause an elevation in ferritin. Erythrocyte microcytosis and hypochromasia suggested that the low RET-He gave the more accurate interpretation; that iron deficiency was present.

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OUTCOMES OF VERY LOW BIRTH WEIGHT PRETERM INFANTS WITH MATERNAL CHORIOAMNIONITIS AND FUNISITIS

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10.1136/jim-2021-WRMC.246

Purpose of Study There is conflicting evidence regarding the effect of funisitis on morbidities and mortalities in preterm infants while chorioamnionitis has been implicated in adverse outcomes. This study aims to evaluate funisitis(FU), histologic chorioamnionitis (HC), and clinical chorioamnionitis(CC) as risk factors for short and long term outcomes of very low birth weight (VLBW) infants.

Methods Used This is a retrospective observational study with data obtained for VLBW (birth weight < 1500 grams) infants, born at our institution between 2009–2018. Electronic medical records and neonatal data bases were used for maternal information, delivery details and the most common neonatal

morbidities and mortality. Neurodevelopmental outcomes were based on Bayleys III Scale completed by a psychologist over three years in a subgroup of patients.

Summary of Results Of the 308 infants studied, those with HC had a higher risk of Intraventricular hemorrhage (IVH) (47.3% vs 32.5%, $P=0.021$) and a higher risk of mortality of (17.6% vs. 7.7%, $P=0.024$). Those with CC had a significant risk of having severe IVH (14.1% vs 2.5%, $P=0.001$). For those with FU, there was no increased risk for IVH (34.1% vs. 45.8%, $P=0.119$) or mortality (12.5% vs. 9.5%, $P=0.394$). Those with HC or CC, there was a decrease in cognitive scores and percentiles (90.36 vs. 96.26, $P=0.021$), ($P=0.039$) at 16–24 months. Language percentiles were also impacted ($P=0.018$). Similarly, in the 26–36 month group, the cognitive percentile ($P=0.049$) and language percentile ($P=0.031$) were impacted significantly. Those infants with FU did not have a difference in cognitive or language percentiles when evaluated in either time frame.

Conclusions FU was not a risk factor in VLBW infants with short term outcomes, mortality, or a significant change in long-term neurodevelopmental outcomes. HC is a risk factor for higher mortality. Having either HC or CC increases the risk for IVH and a delay in cognitive and language development. Early evaluation and intervention for vulnerable preterm infants may be necessary to decrease the unfavorable neurodevelopmental outcomes.

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DELIVERY ROOM RESUSCITATION PRACTICE TRENDS IN A POPULATION-BASED COHORT OF INFANTS BORN AT PERIVIAL GESTATIONAL AGE

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Purpose of Study To determine the rate and trend of active resuscitation in a population-based cohort of infants born at periviable gestational age and to examine maternal and clinical factors associated with active resuscitation.

Methods Used Infants born in 2011–2018 at a gestational age of 22 to 25 weeks at California Perinatal Quality Care Collaborative (CPQCC) affiliated hospitals were analyzed. Active resuscitation in the delivery room was defined as either: 1) intubation, cardiopulmonary resuscitation, and/or epinephrine; or 2) CPAP and/or NIPPV if the infant survived beyond 12 hours after birth. The difference in rate of active resuscitation by gestational age and time period (2011–2014 versus 2015–2018) were compared using a 2-sample proportion test. Multivariable logistic regression was used to identify significant maternal and infant factors that impacted the primary outcome of delivery room active resuscitation.

Summary of Results There were 8252 live born infants included and 6630 infants (80%) were provided active resuscitation. Rates of active resuscitation were low at 22 weeks (19%) and increased with each advancing week (e.g., 95% at 25 weeks). The rate of active resuscitation was significantly higher for those born between 23 weeks 4–6 days (78%) compared to those born at 23 weeks 0–3 days (66%, $p<0.001$). Furthermore, the rate of active resuscitation

among those born at 23 weeks significantly increased from 2011–2014 (66%, 95% CI [62%, 70%]) to 2015–2018 (76%, 95% CI [73%, 79%]) ($p<0.001$). In multivariable analysis, factors associated with greater odds of active resuscitation included maternal black race, increasing gestational age, PPRM, antenatal steroids exposure, cesarean section, singleton birth, and appropriate for gestational age birth weight.

Conclusions Rates of active resuscitation in the delivery room remained low at 22 weeks within CPQCC hospitals. However, at 23 weeks, rates increased significantly over the later part of the week and in 2015–2018 than in 2011–2014. Several maternal and infant level factors influenced the likelihood of active resuscitation.

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FACTORS AFFECTING OUTCOMES OF INFANTS DELIVERED IN AN EMERGENCY SETTING

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Purpose of Study Most neonates transition to extra uterine life without any complications during the delivery process. There are multiple unpredictable and unpreventable obstetric emergencies that may lead to undesirable consequences in newborns. The objective was to review maternal and infant characteristics of emergency deliveries occurring in the labor and delivery unit (LDU) at LAC+USC Medical Center.

Methods Used This is a retrospective chart review of pregnant women admitted to LDU delivering emergently between May 2019 and August 2020. Emergency deliveries outside of the LDU and those with intrauterine fetal demise were excluded. Maternal and neonatal electronic medical records were reviewed and analyzed.

Summary of Results 50 live births met inclusion criteria. The median maternal age was 26 years (IQR24–33 yrs), median gravida 3. The majority (82%) of women presented in labor. 86% of deliveries were via Cesarean section (CS). 54% of women were obese. 56% of women had prenatal complications. 58% had prenatal care starting the 1st trimester; 6% had no prenatal care. Non reassuring fetal heart tracings was the most common reason for emergency CS (72%), followed by uterine rupture (14%), cord prolapse (9%) and placental abruption (5%). Median infant gestational age was 39 weeks (IQR37–40wks) with mean birth weight of 2933 g (SD833 g). Large for gestational age infants constituted 10% of the population. 6% of infants had shoulder dystocia. Advanced resuscitation in the delivery room (DR) was required in 40% of infants, including positive pressure ventilation (38%), intubation (4%), chest compressions (2%), vascular access (2%). Half of the infants required NICU admission. 76% required respiratory support. Most of the infants admitted to NICU required non-invasive positive pressure ventilation (79%), 21% required invasive mechanical ventilation. All infants intubated in the DR underwent therapeutic hypothermia (8% of total infants). Overall mortality rate was 2%.

Conclusions A high numbers of infants require DR resuscitation and NICU admission after delivery in emergency setting. Majority of NICU admissions were secondary to respiratory

compromise. A significant number of infants were at risk for hypoxic ischemic encephalopathy. Better methods to predict emergency deliveries need to be elucidated.

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QUALITY IMPROVEMENT INITIATIVE TO REDUCE TIME TO FULL FEEDS IN INFANTS WITH GASTROSCHISIS

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Purpose of Study To evaluate the effectiveness of a new feeding guideline for infants with gastroschisis in reducing time to full feeds (140 cc/kg/day) from initiation by 15%. Baseline data of patients prior to implementation of the guideline is presented.

Methods Used A feeding guideline for infants with gastroschisis was developed by a multidisciplinary team and implemented in February 2020. Baseline data was collected retrospectively for infants who underwent gastroschisis repair at Children's Hospital Los Angeles from 2016–2019. Exclusions were intestinal atresia, gestational age (GA) less than 32 weeks and birth weight (BW) less than 1250 grams.

Summary of Results A total of 32 infants met the criteria with a mean GA of 37 weeks (35.7–38.3) and median BW of 2576 grams (2246–2880). Twenty infants underwent silo placement with the median time to closure of 8 days. The median time from initiation to full feeds was 13 days and median day of life to achieve full feeds was 32 days. Thirteen infants (41%) required suspension in feeding advancement.

Abstract 250 Table 1 Baseline characteristics N=32

| | |
|--|-------------------|
| Gestational Age* | 37.0 (±1.3) |
| Female Sex (%) | 18 (56.3) |
| Birth Weight (g)* | 2576 (2246, 2880) |
| Small for Gestational Age (%) | 13 (40.6) |
| Silo Placement (%) | 20 (63) |
| Age at Final Closure (days)* | 8 (8, 8) |
| Post Operative Days at Feed Initiation* | 12 (10, 20) |
| Suspension of Feeding Advancement After Initiation (%) | 13 (40.6) |
| NPO days* | 6 (3, 9) |
| Duration of Trophic Feeds (days)* | 3 (2, 4) |
| Time to Reach Full feeds After Initiation (days)* | 13 (10, 20) |
| Day of Life to Achieve Full Feeds (days)* | 32 (26, 41) |
| Central Line Duration (days)* | 29 (22, 36) |
| Length of Stay (days)* | 37 (28, 47) |

*Mean(±SD) +Median (IQR)

Conclusions Baseline data for our gastroschisis population is presented. A guideline was implemented to standardize feeding advancement. The first PDSA cycle is currently underway to help reach our aim of reducing time to full feeds by 15% from 13 to 11 days.

Adolescent medicine and behavior development V

Concurrent session

11:00 AM

Saturday, January 30, 2021

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PERCEPTION AND PREVALENCE OF WITHDRAWAL AS A CONTRACEPTIVE METHOD AMONGST MEDICAL STUDENTS

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Purpose of Study Withdrawal was reportedly used by 5.3% of U.S. women in the latest national study; however, it is not routinely recommended as a birth control method by professional organizations. A dichotomy thus exists between the perception of withdrawal and the extensiveness of its use. The purpose of this study is to determine the prevalence of withdrawal use amongst medical students and identify possible factors associated with greater use of this contraceptive method.

Methods Used In an electronic survey, 150 medical students, who have engaged in heterosexual intercourse when not trying to conceive, were asked about their use of withdrawal as a contraceptive method and factors affecting their choice of contraceptive use.

Summary of Results Of the 57% who reported having used withdrawal to prevent pregnancy, 48% reported having relied on it by itself for birth control. When asked the selection criteria for their most frequently used method recently, ease of use (77%) was the most commonly selected criteria, followed by effectiveness (59%), availability (39%), and cost (33%). When asked the reasons for potentially using withdrawal as their only form of contraception, availability (52%) was the most commonly selected reason, followed by ease of use (47%), difficulty obtaining other methods (29%), and cost (25%). Majority (57%) of respondents said they would be unlikely to use withdrawal in the future; 91% credited low efficacy/unreliability as the reason why.

Conclusions Despite this perception of withdrawal as a poor contraceptive method, this study confirms that withdrawal has been used by a majority of medical students due to its availability, ease of use, and cost. These findings provide more insight into withdrawal use to help health professionals understand the features young adults value in a free method.

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IMPACT OF SEXUAL HEALTH EDUCATION ON WITHDRAWAL USE AND PERCEPTION AMONGST GRADUATE STUDENTS

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10.1136/jim-2021-WRMC.251

Purpose of Study Withdrawal, formally known as 'coitus interruptus', is a widely used but often discounted method of contraception in the United States. Despite the widespread use

and low failure rate of withdrawal when used correctly, use of withdrawal is infrequently discussed in sexual education courses or in medical settings. The purpose of this study is to address associations between sexual health education and perception and use of withdrawal amongst graduate students, and to identify gaps in knowledge regarding withdrawal as a method of contraception.

Methods Used In an IRB-approved project on an exempt basis, 84 male and 100 female medical graduate students were asked about their knowledge and perception of withdrawal, amount of contraceptive counseling received, and their personal practices in an anonymous electronic survey.

Summary of Results Of the 160 students who had taken sexual education courses, 45% reported that withdrawal, or the 'pull-out' method, was discussed. Furthermore, less than 2% of those respondents reported ever being counseled about withdrawal in a medical setting. A majority of surveyed students (91%) also reported low efficacy as a reason to not use withdrawal as their only method of contraception, despite 56% of respondents having used withdrawal in the past. Of note, 58% of surveyed students who admitted to ever having used withdrawal for birth control were female, versus 42% of whom were male.

Conclusions The results of this study reveal that there is not a significant association between use and perception of withdrawal and contraceptive education about withdrawal in either medical counseling or sexual education courses. However, the study sheds light on the limited awareness of withdrawal and its efficacy in spite of receiving sexual health education in various settings. Existing research on coitus interruptus suggests that individuals who are unfamiliar with other contraceptive methods and individuals who have been unsatisfied with all other contraceptive choices are most inclined to use withdrawal. These findings

highlight the need for health care professionals and sexual health educators to expand their efforts to include more comprehensive information on a commonly used method of contraception.

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EFFECT OF INTERVENTIONS TO IMPROVE CHILDHOOD VACCINATION WITH A FOCUS ON UNDERSERVED POPULATIONS

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Purpose of Study Vaccination compliance continues to be a challenge. Although there are several studies on interventions to improve influenza and adolescent vaccination rates, studies of interventions to improve vaccinations in low income or minority young children are sparse. The objective of this study is to determine the efficacy of interventions to improve vaccination status in very young children.

Methods Used A comprehensive literature search was utilized through multiple search engines, such as PubMed, Google Scholar using key words, 'reminder', 'vaccine', 'health disparity', 'low income', 'intervention' and 'children'. Only studies performed in the United States that focused on use of interventions to improve timely administration of childhood (≤ 24 months) vaccines in low income or minority populations were included.

Summary of Results We found 5 studies that matched our inclusion criteria. The populations studied were predominantly African American, on public insurance, or from low-income families. The 24-month vaccination rates before the

Abstract 253 Table 1 Intervention studies to improve childhood vaccinations

| Author, year, location | Subject population | Control cohort | Intervention cohort | Reminder intervention | Vaccination rate before intervention vs after intervention |
|--------------------------------------|--|--|---|--|---|
| Szilagyi, P. 2002, Monroe County, NY | Inner City (n= 1653), 64% Medicaid, 79% African American and Hispanic; Rest of City (n=938), 38% Medicaid, 52% African American and Hispanic; Suburbs (n= 598), 8% Medicaid, 10% African American and Hispanic | 1993 historical control | 1996 early phase intervention; 1999 main intervention | Community wide phone calls, postcards, home visits in 10 practices | 1993 vs 1999 Inner City: 55% vs. 84%*; Rest of City: 64% vs 81%*; Suburbs: 73% vs 88%* 1996 vs 1999 decrease in disparity: White vs black: 12% to 8%*; White vs Hispanic: 11% to 5%* |
| Wood, D. 1998, Los Angeles, CA | Mother-infant pairs (n=419), 100% Medicaid, 100% African American | Patients with Health Passport that included the vaccination record (n=210) | Health passport with vaccination record, and case management (n=209) | Case manager home visits 2 weeks prior to immunization date | 50.6% vs 63.8%* |
| Hoekstra, E. 1998, Chicago, IL | Children (n=16581) whose mothers have WIC; insurance type not described, 80% African American or Hispanic | 1996 historical control: no voucher incentives and monitoring | 1997: Voucher incentives and monitoring | Voucher incentives that were issued to cover 3 months | 56% vs 89%* |
| Vora, S. 2009, Chicago, IL | Mother-infant pairs (n=400), 81% Medicaid, 100% African American | 2001 and 2002 historical control | BIRTH PIP | Phone calls, mail, home visits | 49% vs 92%* |
| Ahlers-Schmidt, C. 2012, Wichita, KS | Pediatric patients (n=90), 59% public insurance, 16% African American | Patients received appointment reminder card (n=40) | Patients received appointment reminder card and text reminders (n=50) | Text reminders 7 days prior to immunization date | 2 months: 80% vs 100%; 4 months: 70% vs 89%; 6 months: 68% vs 79% 40% of patients in intervention group were lost to follow up due to disconnected phone service. |

*p < 0.05; WIC (Special Supplemental Nutrition Program for Women, Infants, and Children); BIRTH PIP (At birth pediatric immunization program).

intervention ranged from 49% to 55% in underserved population. After the interventions, the rate increased by 13–43%. Studies that involved more intensive interventions, such as in-person education, voucher incentives, and combination of phone call, mail, and text message reminder systems were very effective in increasing vaccination rates in children ≤ 24 months of age.

Conclusions Our review suggests that various intervention methods are effective in increasing vaccination rates in underserved populations. However, even after the intervention, vaccination rates remained suboptimal in some studies. Additional prospective controlled trials comparing different targeted intervention methods with a focus on health inequities are needed.

254 IMPROVING ACCESS TO ETONOGESTREL IMPLANT AT CHILDREN'S HOSPITAL LOS ANGELES (CHLA)

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Purpose of Study Although etonogestrel implants are considered first-line contraception for adolescents, they may not be accessible to providers at CHLA-affiliated AltaMed clinic, nor is learning to place them a requirement for pediatric trainees per American College of Graduate Medical Education (ACGME) guidelines. This study identifies number of providers trained, provider comfort level counseling benefits and side effects of implants, potential barriers that prevent providers from getting trained, and provider-perceived likelihood of placing implants if trained.

Methods Used An 11-question survey was distributed three times via RedCap to ~270 AltaMed pediatricians and CHLA pediatric residents. Responses were compared by provider status (Attending vs. Resident) and adolescent patient volume (4 +/month vs. 1–2/month). Chi-square analysis was done to compare responses between groups.

Summary of Results There was a 21% survey response rate ($n=56$). 89% of respondents were not trained, including 97% of residents and 87% of those who saw 4+ teenagers per month. 64% and 38% of respondents respectively felt comfortable counseling about benefits and side effects of implants. Top reported barriers to training were: training not offered (24%), lack of access to training (20%), insufficient time for training (19%), and low patient volume to justify training (14%). More residents reported lack of access to training, while more attendings reported time constraints preventing training. Greater than two-thirds of providers estimated placing 1–5 implants/month if trained.

Conclusions The greatest barrier reported was lack of access to training, with residents more likely to seek training and report fewer time constraints. Although fewer providers were comfortable counseling about side effects, it was not a perceived barrier. To improve future access to contraceptive implants, training of pediatric residents should be required by ACGME. However, lack of trained attendings and need for coordination of the entire medical team may limit current use in clinics. Impacts of formal training on short- and long-term provider behaviors and patient access to implants should be studied in future projects.

255 A RARE PRESENTATION OF HENOCH-SCHONLEIN PURPURA AS HEMORRHAGIC BULLOUS LESION IN AN ADOLESCENT

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10.1136/jim-2021-WRMC.254

Purpose of Study Henoch-Schonlein purpura (HSP) also known as Immunoglobulin A vasculitis is the most common childhood systemic vasculitis affecting the skin, gastrointestinal tract, joints, and kidney. Skin lesions of HSP typically present with non-thrombocytopenic palpable purpura of the buttocks and lower extremities. <2% of children with HSP cases develop hemorrhagic bullous lesions (Trapani et al, 2010). We present an unusual case of hemorrhagic bullous HSP in an adolescent female who responded well to dapsone.

Methods Used Single patient case report.

Summary of Results A 16-year-old female with a history of DM type 1 presented with palpable, purpuric lesions on her foot and arthritis of the ankle joints. The rash progressed to involve her lower extremities and buttocks. She reported a self-limiting URI two weeks prior. She denied any fever, abdominal pain, or dysuria. Two days later, the rash progressed to the trunk and extensor surfaces of upper extremities, with blistering and painful hemorrhagic bullous lesions. CBC with diff was unremarkable, CRP 5.01 mg/dL, and ESR 27 mm/hr. Autoimmune, vasculitis, and infectious panels were negative. Renal function remained normal. Initial skin biopsy was inconclusive due to sample size. Oral prednisone was initiated and IVIG was added due to minimal skin improvement. A repeat skin biopsy revealed leukocytoclastic vasculitis, consistent with HSP. The patient was discharged home with steroid dose taper. Patient relapsed with new skin lesions. She responded well to dapsone and penicillin was started as prophylaxis for extensive skin lesions.

Conclusions Hemorrhagic bullous HSP is rare in children and may require more aggressive care than the typical presentation of HSP especially in adolescents. Treatment includes corticosteroids for anti-inflammatory effects and IVIG for lesions refractory to corticosteroid (Mauro et al, 2018). Dapsone has been shown effective due to its anti-IgA, antioxidant and anti-neutrophilic effect (Iqbal & Evans, 2005). Additionally, bullous lesion in pediatric population warrants an early skin biopsy to rule out bullous pyoderma gangrenosum, a neutrophilic dermatosis and to initiate treatment accordingly. Further studies are needed to determine the pathophysiology and management of hemorrhagic bullous HSP.

256 POSTERIOR REVERSIBLE ENCEPHALOPATHY SYNDROME FOLLOWING STEROID TREATMENT FOR DRUG RASH IN A PEDIATRIC PATIENT

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10.1136/jim-2021-WRMC.255

Case Report DRESS (drug rash with eosinophilia and systemic symptoms) is a syndrome of severe drug reaction that typically presents with fever, morbilliform rash, lymphadenopathy, eosinophilia and transaminitis. Symptoms develop, on average, 23.8 days after drug exposure. Treatment involves prompt removal of the causative agent and systemic steroids in severe cases. PRES (posterior reversible encephalopathy syndrome) is

Abstract 256 Table 1 Clinical course timeline

| | |
|-----------|--|
| Day 0–5 | Zonisamide stopped. Methylprednisolone initiated using admission weight (dosing 50% greater than intended due to anasarca) |
| Day 9–11 | Two seizures occurred. Spike in blood pressure. AMS seen. MRI shows PRES. |
| Day 12–19 | Steroid wean started. Improved blood pressure and mental status seen. |

characterized by headache, seizures, and encephalopathy, often associated with hypertension.

We present the case of a 9 year old boy with a history of well-controlled epilepsy on levetiracetam who presented with 13 days of fever and rash. Four weeks prior to admission, levetiracetam was switched to zonisamide for concerns of weight gain. On arrival, he was febrile, with erythematous lesions on buccal mucosa, bilateral conjunctival injection, and generalized papules and macules with significant anasarca. Laboratory findings were remarkable for leukocytosis, transaminitis, elevated inflammatory markers, and elevated HHV-6 serology. He was treated with steroids (dosing based on admission weight) for a presumed diagnosis of DRESS secondary to zonisamide, then developed hypertension and subsequent acute encephalopathy. MRI findings showed multifocal, bilateral gyriform foci in a posterior distribution consistent with PRES. His altered mental status improved as steroids were weaned and blood pressure stabilized.

In our literature review, we found one patient with PRES following treatment for DRESS. Our patient presents a clinically complex pediatric case of DRESS, treated with steroids, who developed hypertension and eventually PRES, a rare phenomena in the pediatric population. Thus, we urge clinicians to: (1) stay vigilant in monitoring elevated blood pressures in the pediatric population, where it can be easy to dismiss or miss; (2) monitor steroid use and resulting HTN and; (3) be mindful of acute weight changes when dosing, as differences can lead to substantial consequences.

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VARIATIONS IN CLINICAL AND LABORATORY PRESENTATION OF UTI IN MEDICALLY COMPLEX PATIENTS

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10.1136/jim-2021-WRMC.256

Purpose of Study In medically complex children (MCC), evaluating for urinary tract infections (UTI) can be complicated due to vague and nonspecific presentation. The current American Academy of Pediatrics criteria for UTI diagnosis is based on findings in otherwise healthy children, thus this poses an issue for MCC. We sought to describe urinalyses and clinical presentations in symptomatic children with varying levels of medical complexity.

Methods Used A retrospective cross-sectional analysis was performed of all patients admitted to a single freestanding children's hospital with an ICD-9 or ICD-10 diagnosis of UTI (cystitis or pyelonephritis) from January 1, 2018-December 31, 2019. Demographic data were collected, as were urinalysis characteristics and culture results. Continuous data were assessed with measures of central tendency, and comparisons among groups of MCC (complex chronic [CC], non-complex chronic [NCC] and non-chronic [NC]) were performed using

t-tests and analyses of variance, while proportional outcomes were assessed using chi-square and Fisher's exact tests.

Summary of Results A total of 119 patients had 133 admissions. Males comprised 47.1%, 17.6%, and 23.5% of CC, NCC, and NC patients, respectively ($p=0.10$). CC patients were significantly older (median age 11.1 years) than NCC or NC patients (median age 4.2 and 7.0 years, respectively; $p=0.0035$). While patients in all three groups were equally likely to be febrile, CC patients (35.4%) were less likely than NCC (82.4%) or NC (70.6%) patients to have vomiting/nausea ($p<0.0001$). Elevated CRP was more often seen in NC patients (75%) than in CC (18.2%) or NCC (33.3%) patients ($p=0.007$), while pyuria was seen in fewer NCC (47.5%) than CC (70.7%) or NC (73.5%) patients ($p=0.02$). Three patients had negative urine cultures. All patients received a 10–14 day antibiotic course (82% orally).

Conclusions CC patients presented with symptoms less likely to align with 'typical' UTI symptoms; however, the finding that three patients had negative urine cultures underscores the need for comprehensive evaluation of all children with suspected UTI. Clinicians must be aware of variations in UTI presentation and balance prompt initiation of therapy with the potential harms of antibiotic administration.

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IMPROVING COMPLETION RATES OF MATERNAL DEPRESSION SCREENING IN AN ACADEMIC PEDIATRIC PRACTICE

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10.1136/jim-2021-WRMC.257

Purpose of Study The American Academy of Pediatrics recommends that Pediatricians screen all postpartum women for maternal depression. Maternal depression not only affects mothers, but also can have negative consequences on the child's health and development. The purpose of this study is to determine whether there is a provider bias among Pediatricians in screening for maternal depression at well-child check-ups. The results will shed light on provider biases and will help increase screening rates.

Methods Used This was a retrospective study within the Division of Primary, Complex Care at Phoenix Children's Hospital from 7/1/19 to 3/31/20. Maternal depression screening was conducted utilizing a validated 2-question screening tool, the Patient Health Questionnaire (PHQ2). This tool was administered to mothers at their well-child check-ups (months 1, 2, 4, and 6). Analysis was based on completion of the screening, race/ethnicity of the mother, maternal language, infant age, and socioeconomic status.

Summary of Results A total of 401 patient encounters were collected and patient demographic characteristics were reported. Individual comparisons between the 4 time points were assessed using the McNemar's test followed by multiple comparisons adjustment. Results showed statistically significant increases in depression screening between 1 month (N=156, 38.9%) and 2 months (N=187, 46.6%) for all patients ($p<0.008$) and patients with public insurance from 1 month (N=117, 39.4%) to 2 months (N=142, 47.8%) ($p<0.008$) following the Bonferroni Correction. A logistic regression analysis showed that Hispanic mothers were two times more likely to be screened at 1 month (odds ratio 2.08, CI 1.01, 4.32).

For longitudinal analysis, the generalized estimating equation showed that at 2 months, the odds of all mothers being screened was 8% higher than at 1 month (OR 1.08, $p < 0.002$). Mothers with boys had a 3% increase in being screened at each well-child visit (OR 1.03 $p < 0.039$ and patients with private insurance had a 5% increase in screening at each visit (OR 1.05 $p < 0.032$).

Conclusions This study suggests that there are screening biases among Pediatricians for postpartum depression that are influenced by infant gender, race/ethnicity of the mother, maternal language, and socioeconomic status.

COVID – Infectious diseases II

Concurrent session

11:00 AM

Saturday, January 30, 2021

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EFFECTS OF COVID-19 ON MORBIDITY AMONGST PATIENTS WITH PRE-EXISTING ASTHMA IN THE CENTRAL VALLEY DURING THE EARLY PANDEMIC

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10.1136/jim-2021-WRMC.258

Purpose of Study Current data is unclear as to whether asthma increases morbidity due to SARS-CoV-2 infection¹. In Central Valley counties, rates of asthma range from 18 to 26.8% compared to 15.2% statewide². This study investigated asthma as risk factor in confirmed COVID-19+ patients in this region during the initial phase of the pandemic.

Methods Used De-identified data was obtained from a registry of COVID-19+ cases in a tertiary hospital system in the Central Valley Apr-May 2020, & classified based on health outcomes. Outcomes obtained: # of hospitalizations w/in the past 90 days, length of hospital stay (LOS), ICU admission, risk scores based on chronic conditions, age, gender, length of ICU stay, & deaths of patients with & w/o asthma. ICU patients were delineated by COVID as primary or secondary with other co-morbidities.

Summary of Results The study had 360 patients, where 18.6% had asthma, 80.3% w/o asthma, & 1.1% were unknown. Due to COVID, 35.8% of the asthmatic patients were hospitalized, & 11.9% in the ICU. In comparison, 22.5% of the non-asthmatic patients (controls) were hospitalized & 9.3% in the ICU. The avg. age was 46.7 yrs., & male to female ratio was 1.2:1. Patients with asthma had significantly higher risk of hospitalization compared to controls (1.21 vs. 1.08, $p = 0.04$). The LOS did not differ between the two groups. Yet, asthmatic patients when admitted with COVID, had avg. longer ICU stay (17.4 to 12.7 days $p = 0.166$). When risk stratification was applied, asthmatic patients had avg. greater general risk score of 3.6 to 3.1 compared to control ($p = 0.159$). They also had a significantly greater avg. # of chronic meds (8.6 vs. 5.3 $p = 0.000$) and co-morbidity score (1.2 vs 0.78, $p = 0.006$). Of the 4 deaths from COVID related disease, 3 had asthma & required ICU care.

Conclusions Patients with asthma had a greater: admission rate, ICU stay, general risk, # of chronic meds, &

comorbidities. Whether their COVID disease severity was primary or secondary to comorbidity factors needs further study. Pre-assessment of asthma risk & comorbidity is useful to predict outcomes during this pandemic. This particularly applies to patients in the Central Valley, where asthma prevalence is greater across all age & demographic groups.

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A UNIQUE HOST IN HIV AND MORBID OBESITY FOR COVID-19

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10.1136/jim-2021-WRMC.259

Case Report Introduction: Severe acute respiratory syndrome (SARS-CoV-2) is part of the beta-coronaviridae family. This virus has been shown to cause pneumonias which can rapidly progress to acute respiratory distress syndrome. We present a case of an HIV+, morbidly obese (BMI – 56) patient that survived infection with SARS-CoV-2.

Case description On March 17, a 45-year-old male with a significant medical history of a BMI 56, previous pulmonary embolism, HIV and diabetes mellitus was admitted to the hospital with shortness of breath (SOB) after several days of cough and flu-like symptoms. He had a qSOFA score of 0 and his blood cultures were negative. WBC was within range at 9.1K/uL. Computed tomography angiography was performed and showed no pulmonary embolism. On March 25th, he tested positive for COVID-19 via PCR. The patient was discharged on March 30th to self-isolate. He presented with SOB on a telemedicine follow-up visit on April 2nd and retested positive for COVID-19 via PCR. CT values were monitored from the first positive CT PCR test on March 25th to April 30th when the virus was no longer detected.

Discussion Both diabetes and a BMI greater than 40 have shown to be high risk factors for severe illness in SARS-CoV-2 infection in addition to high IL-6 levels. Furthermore, obesity is considered a state of low-grade inflammation, with IL-6 being one of adipose tissue's major interleukins released. While IL-6 was not elevated in this patient's case, he was HIV positive which can increase IL-6, and lead to worse outcomes with COVID-19. Importantly, greater visceral adipose tissue has shown to increase the need for intensive care in COVID-19 cases. As such, SOB and lack of oxygen are what categorize COVID-19 patients as 'symptomatic,' however, they are also common presentations in morbidly obese patients. This poses a challenge for clinicians when deciding how to classify their patient per CDC/WHO guidelines.

Both HIV and obesity are thought to have played a role in this patient's viral persistence and extended shedding period. While more research is needed for this subset of patients, this case provides a look into how HIV and obesity serve as a unique host for the novel SARS-CoV-2 virus, as well as provide a picture of how difficult such cases can be to manage.

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SEX DIFFERENCES IN ANXIETY DISORDERS AND LOW SOCIOECONOMIC STATUS DURING THE COVID-19 PANDEMIC

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10.1136/jim-2021-WRMC.260

Purpose of Study The coronavirus disease 2019 (COVID-19) pandemic imposes an unprecedented stressor on all aspects of society, including mental health and economic instability. The objective for this study was to analyze information regarding the psychological responses and economic consequences males and females are experiencing. Based on prior literature (Jainapurkar, 2018), females are more likely to develop anxiety compared with men due to social roles and income (de Mola, 2020). In light of this, it is anticipated the economic and psychological effects of the pandemic will disproportionately affect females compared to males during the COVID-19 outbreak.

Methods Used A nationally representative survey was administered to 1,006 healthy individuals over the age of 18 in the month of April, 2020, near the outset of the nationwide attempts to control the spread of COVID-19. A total of 439 males and 567 females participated in this study. Participants completed the Zung Self-Rated Anxiety scale, General Anxiety Disorder 7-item scale (GAD 7), and annual income report. Finally, participants reported if they experienced the loss of their primary job.

Summary of Results A GAD 7 cut score of ≥ 8 (Plummer, 2016) was used to assess clinically significant anxiety. Significantly more females ($n = 107$; 25.2%) exceeded this cutoff than males ($n = 210$; 38.1%; $p < 0.001$). Additionally, a Zung Self-Rated Anxiety cut score of ≥ 45 (Dunstan, 2020), was used to assess clinically significant levels of anxiety. Again, a greater proportion of females ($n = 121$; 21.4%) exceeded this cutoff compared to males ($n = 72$; 16.5%; $p = 0.049$). There was no statistically significant difference in the annual income of males versus females. However, there were significantly different levels of anxiety associated with income quantiles between sexes. There is a higher proportion of anxiety among people in the lower income group. In addition, females exhibit higher rates of anxiety than males regardless of income. Finally, females showed a trend toward higher rates of primary job loss ($n = 110$; 19.4%) than males ($n = 65$; 14.8%) ($p = .057$).

Conclusions Females reported higher levels of anxiety than males, regardless of income, in addition to higher rates of primary job loss. Finally, higher rates of anxiety are present among people in the lower income group.

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IMPACT OF ALTITUDE ON CORONAVIRUS-DISEASE-2019 PER CAPITA INFECTION, DEATH, AND MORTALITY RATES IN THE UNITED STATES: A MODELING AND OBSERVATIONAL STUDY

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10.1136/jim-2021-WRMC.261

Purpose of Study We sought to determine if COVID-19 infection, death, and case mortality rates differed in high altitude (HA) versus low altitude (LA) U.S. counties.

Methods Used Using publicly available geographic and COVID-19 data, we calculated per capita infection, death, and case mortality rates in HA and LA U.S. counties matched by population density. We also performed population-scale regression analyses to investigate the association between county elevation and COVID-19 infection rates.

Summary of Results Comparison of LA (< 914 meters above sea level, $n=58$) counties of similar population density as HA (>2133 meters above sea level, $n=58$) counties yielded significantly lower COVID-19 per capita cases at HA versus LA (615 cases versus 905 cases per 100,000 population, $p=0.034$). HA county per capita deaths due to COVID-19 were significantly lower than LA county per capita deaths (9.4 deaths versus 19.5 deaths per 100,000 population, $p = 0.017$). However, COVID-19 case mortality did not differ between HA and LA counties (1.78% versus 1.46%, $p = 0.267$). Regression analysis, adjusted for relevant covariates, demonstrated decreased COVID-19 infection rates by 12.26%, 11.68%, and 11.40% per 495 m of county elevation, for cases recorded over the preceding 30, 90, and 120 days, respectively.

Conclusions This population-adjusted, controlled analysis suggests that residence at HA attenuates the risk of COVID-19 per capita infection and death, but does not attenuate mortality. Further research is required to identify the specific environmental, biological, and social factors of residence at HA that contribute to infection, transmission, and pathogenesis of COVID-19.

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DECREASED MORTALITY RATE AMONG COVID-19 PATIENTS USING STATINS: DATA FROM US ELECTRONIC HEALTH RECORDS

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10.1136/jim-2021-WRMC.262

Purpose of Study The use of statins has been associated with a reduced rate of mortality and other severe outcomes among patients with coronavirus disease 2019 (COVID-19). Our goal was to leverage data from Electronic Health Records (EHR) to investigate this hypothesis in a diverse population in the United States.

Methods Used Data were obtained and analyzed from Cerner's large COVID-19 EHR database containing nearly 120,000 records of COVID-19 patients across 62 healthcare centers. All patients had an emergency room visit or were hospitalized. Only patients with a COVID-19 diagnosis confirmed by a lab test were considered. COVID-19 patients with exposure to statin medications, defined as at least one medication order for a statin within a period of 10 days before and 7 days after a positive COVID-19 lab test, were compared to COVID-19 patients who did not have a medication order for statins. Propensity-score (PS) matching with a 1–2 ratio was used to match patients by demographics (age, sex, ethnicity, race), and by comorbidities (hypertension, diabetes, COPD) and medication indication (high cholesterol, hyperlipidemia) as identified by ICD codes.

Summary of Results 2,855 patients were taking statins, and 18,875 patients had not. After matching, the average age among statins patients (66.9 years) equated to an average age in non-statin patients (66.8 years). Among statins patients, the mortality rate was 16.0%. We carried out 10 iterations of PS matching by demographics and comorbidities, and observed significantly higher mortality among control patients (17.4% to 19.7%) in 8/10 times (Chi-square test, $p < 0.05$). When

carrying out 10 iterations of PS matching by medication indication as well as demographics and comorbidities, we again found significantly higher mortality in controls (17.7% to 20.0%) in 9/10 times (Chi-square test, $p < 0.05$).

Conclusions Among COVID-19 patients using statins we observed a statistically significant decrease in mortality when compared to matched controls. These results support previous evidence that statins may reduce severity of COVID-19-related mortality.

264 HISPANIC PARADOX IN THE SETTING OF THE COVID-19 PANDEMIC

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10.1136/jim-2021-WRMC.263

Purpose of Study The Hispanic Paradox is an epidemiological finding in which Hispanic Americans tend to have better, mortality rates than Non-Hispanic White Americans and a decreased prevalence stroke, cancer, and hip fracture. Our purpose was to observe the Hispanic Paradox during the COVID-19 pandemic in regards to mortality.

Methods Used The published data of Hispanics and NH-Whites were obtained from the Department of Public Health of California and spans from April to September. It was compiled in excel to show the Hispanic Paradox in percent cases and percent deaths related to COVID-19.

Summary of Results According to the California Department of Health, as of April 2020, Hispanics made up 36% of cases of COVID-19, which is the highest percentage amongst all populations that occupy California. This number was comparable to the 32% of cases accounted for by NH-Whites. Hispanics made up the second highest percentage of deaths at 28% which is second to the 41% of NH-White deaths. This data gives an overall picture of the early stages of the pandemic. As the pandemic continued Hispanics have higher cases and deaths than NH-White. The cases and deaths are the greatest for Hispanics aged between 18 and 79, however, they are

steadily decreasing for Hispanics while increasing for Caucasians. This trend continues until the age of 80 where there is a complete reversal of the trend and percent cases and percent deaths for Caucasians is greater than that of Hispanics.

Conclusions We show that over the age of 80, Hispanics in California have less percent death related to COVID-19 compared to NW-Whities. With differing hypotheses for this anomaly and no agreed upon explanation, the recent pandemic has shed more light on the Hispanic Paradox that coincides with other disease states, and it is noteworthy to see its effects in a novel viral pandemic.

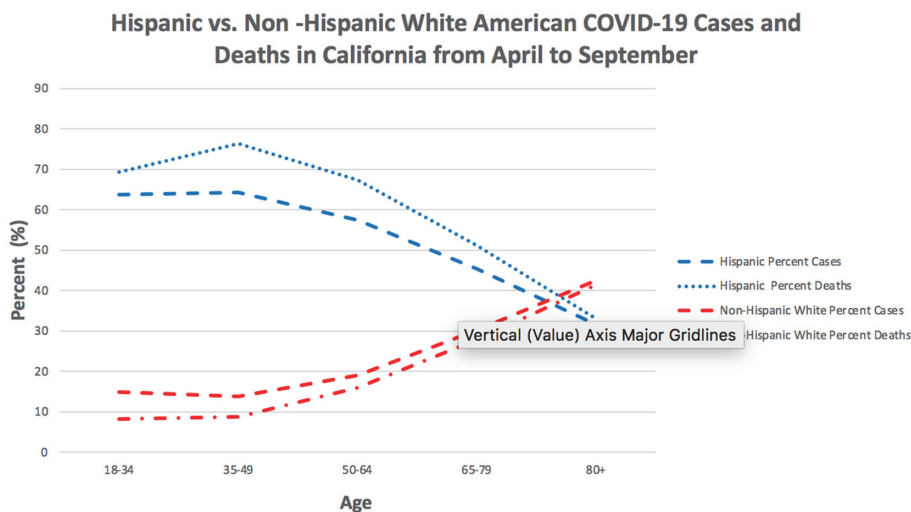
265 EVALUATING THE RISK OF COVID-19 ILLNESS AMONG EMS PROVIDERS FOLLOWING CARDIOPULMONARY RESUSCITATION AND AEROSOL GENERATING PROCEDURES

¹AD Brown*, ²L Schwarcz, ¹CR Counts, ²L Barnard, ¹BY Yang, ²J Emert, ¹AJ Latimer, ²C Drucker, ²J Blackwood, ¹P Kudenchuk, ¹M Sayre, ¹T Rea. ¹Univ. of Wash. School of Medicine, Seattle, WA; ²Public Health Seattle and King County, Seattle, WA

10.1136/jim-2021-WRMC.264

Purpose of Study Emergency Medical Services (EMS) providers may treat patients with COVID-19 illness without knowing the patient's COVID-19 status. Aerosol generating procedures (AGPs) are believed to increase occupational risk. The magnitude of risk from AGPs while wearing personal protective equipment is unclear. We evaluated the risk of EMS providers acquiring COVID-19 when AGPs were vs. were not used during the care of COVID-19 patients.

Methods Used This retrospective cohort study identified patients from a statewide COVID-19 registry with a positive COVID-19 nasopharyngeal swab (RT-PCR+) within 10 days of an EMS encounter, between Feb. 16 and July 31, 2020 in King Co., WA. AGPs were defined as endotracheal intubation, supraglottic airway insertion, bag-valve mask ventilation, continuous positive airway pressure, non-rebreather (NRB) oxygen, and nebulizer or metered dose inhaler medication therapy. COVID-19 transmission was attributed to the



Abstract 264 Figure 1

encounter if the EMS provider's RT-PCR+ test occurred ≤ 14 days after the encounter.

Summary of Results 3231 EMS provider-encounters involved 1722 unique EMS providers who cared for 1155 COVID-19 patients. Of the 1382 COVID-19 patient encounters, 1162 involved no AGP and 220 had at least one AGP. The most common AGPs were NRB oxygen (77%), positive pressure ventilation (27%), and advanced airway (18%); 25 (11%) required chest compressions. During the study period, 3 of the 1722 EMS providers became RT-PCR+ within 14 days of the COVID-19 patient encounter. One provider had both AGP and no AGP encounters, while one performed no AGPs and the third only had AGP encounters. Overall incidence of EMS COVID-19 infection after occupational exposure was low (0.93/1000 provider encounters).

Conclusions EMS COVID-19 occupational risk attributable to patient encounters was quite low. The analysis was limited by the very small number of RT-PCR+ providers precluding a meaningful comparison by AGP encounters. Continued analysis and surveillance are ongoing to refine these results and enable a robust comparison of AGP-specific risk.

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INCORRECT FACE MASK USE AND POTENTIAL COVID-19 EXPOSURES IN PUBLIC LOCATIONS

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10.1136/jim-2021-WRMC.265

Purpose of Study To evaluate proper mask use and social distancing behaviors that prevent COVID-19 transmission among the general public.

Methods Used This was a prospective, observational study in a large, urban city. In accordance with CDC guidelines, we developed study definitions for breaches (two persons with mouth or nares exposed while coming within six feet of each other), and incorrect mask-wearing (mouth or nares exposed). Ten medical students were trained on data collection using a standardized data collection instrument and sample videos. Over a two-week period, data collectors observed the public in numerous public settings. Information was collected on estimated age group and gender, socially grouped vs alone, mask use, style of incorrect mask use, and the number of breaches.

Summary of Results From August 23rd - September 5th, 2020, 16084 individuals were observed over 139 hours, of which 2960 (18.4%) were not wearing a mask. Of those wearing a mask, 1495 (11.4%) were wearing the mask incorrectly. In total, there were 2903 breaches. The percentage of people not wearing masks varied by location type: airport (4.4%), grocery store (13.1%), hardware store (1.7%), street intersection (36.2%), city park (29%), city square (31.6%), public transit (29.3%), and waterfront (44.3%). Incorrect mask use varied by location type: airport (7.0%), grocery store (9.4%), hardware store (3.8%), street intersection (17.5%), city park (18.5%), city square (37.7%), public transit (20.1%), and waterfront (15.4%).

Conclusions In a city where mask use is required on public transit and indoor public spaces, our results suggest that most

people are compliant with mask-wearing mandates. Outdoors, however, people commonly do not wear masks, or wear them incorrectly and do not appropriately maintain physical distancing.

Health care research V

Concurrent session

11:00 AM

Saturday, January 30, 2021

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EVALUATION OF DATA TRANSFER OF PERINATAL HEPATITIS C VIRUS EXPOSURE RISK DATA IN A MULTISITE HEALTH SYSTEM

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10.1136/jim-2021-WRMC.266

Purpose of Study Ensuring adequate testing for children born to mothers infected with hepatitis C virus (HCV) is imperative to identify and treat HCV-positive children. Previous studies have indicated <30% of exposed children are appropriately tested for HCV infection. One key part is accurate transfer of HCV test results from the maternal to infant chart. We evaluated data transfer in our regional clinics.

Methods Used To evaluate the data sources and documentation related to HCV infection, we performed qualitative interviews with clinical staff at six large clinics that provide prenatal and newborn care within Southcentral Foundation. This center provides a wide range of health services through multiple regional clinics; all of which share a single electronic medical record system. Variation in provider type was incorporated within the selection of interviewees.

Summary of Results Most interviewees (12/13) noted a lack of consistency regarding the placement of HCV information within both maternal and infant records and how this increases time spent reviewing charts. Five participants reported maternal HCV data could be provided in six different locations within the chart note, with variability between departments. Inconsistent placement of information was also noted regarding the location of infant HCV information and the placement of infant HCV exposure information.

Many interviewees (9/13) identified a benefit of direct communication, either verbal or through a patient message, between the obstetrics and pediatric teams to bring attention to infant HCV exposure. Participants suggested including follow up instructions in the discharge summary for infants at risk of perinatal HCV infection. Six interviewees identified the ideal solution for ensuring proper transfer of HCV data as an add-on within the medical record program that would automatically transfer all maternal laboratory data into the infant chart.

Conclusions We conducted interviews with different clinicians and identified a lack of consistent data reporting and placement as well as key issues regarding data transmission of HCV information from the maternal chart to infant chart.

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UNPLANNED HOSPITAL READMISSIONS AT BRITISH COLUMBIA CHILDREN'S HOSPITAL

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10.1136/jim-2021-WRMC.267

Purpose of Study An unplanned hospital readmission (UHR) occurs when a patient is discharged from the hospital and is then unexpectedly readmitted within 30 days. UHRs are linked to adverse health outcomes and cost Canada \$1.8 billion annually. Anticipating UHRs may improve patient care and decrease cost. This study identified factors associated with UHRs at BC Children's Hospital (BCCH) and analyzed how they have changed across 10 years.

Methods Used The BCCH discharge abstract database (DAD) was used to retrospectively analyze all admissions from April-March of 2007–09 and 2017–19. Admissions were categorized as index admissions (preceding a UHR) or control admissions (all other). Covariables were extracted from the DAD and stratified by admission type.

Summary of Results From 2017–19 there were 11,850 admissions, of which 777 were index admissions (6.6%). Compared to the control group, index admissions were associated with: a longer length of stay (6.7 vs 6.1 days), more admissions via the ER (64.2% vs 47.5%), older age (8.0 vs 7.6 years), longer ICU stay (4.68 vs 3.18 days), more ER visits in the 6 months prior (31.5 vs 8.1), more pre-admission comorbidities (1.2 vs 0.7), and fewer post-admission comorbidities (0.3 vs 0.6). The 3 most common diagnoses associated with index admissions were chemotherapy for a neoplasm (6.4%), vomiting alone (3.0%), and unspecified acute lower respiratory infection (2.2%). The 3 most common diagnoses associated with the control group were chemotherapy for a neoplasm (6.2%), predominantly allergic asthma without status asthmaticus (2.6), and obstructive sleep apnea (1.7%).

In comparison, from 2007–09 there were 11,223 admissions, of which 1,149 were index admissions (10.2%). Similar trends were shown, however, differences in index admissions included a longer length of stay (7.6 days), fewer admissions via the ER (51%), longer ICU stay (5.3 days), and more surgical day care visits in the 6 months prior (10.3 vs 4.8).

Conclusions Covariables associated with index admissions have been identified and hold potential predictive value. We will use these to develop UHR risk prediction models which may allow for future quality improvement projects to decrease UHRs.

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UNDERSTANDING GAPS IN CARE: EXPLORING NEIGHBORHOOD LEVEL RESOURCES FOR CERVICAL CANCER SCREENING IN CHICAGO, IL

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10.1136/jim-2021-WRMC.268

Purpose of Study Cervical cancer is the third leading cause of gynecologic cancer in women in the United States. While studies have demonstrated that certain characteristics of a woman's neighborhood, including socioeconomic status and clinical resources, put her at a greater risk for developing

different types of cancers, this link is yet to be studied in cervical cancer incidence and mortality in Chicago.

This community needs assessment was designed to assess health care facilities in Chicago that perform pap smears and colposcopies to better understand geographical gaps in accessibility. Then, to compare these possible gaps to incidence and mortality of cervical cancer in neighborhoods with barriers such as: socioeconomic status, race and geographic location.

Methods Used An analysis of 76 healthcare facilities was performed in Chicago, IL. Brief interviews were conducted with each health care facility, including Federally Qualified Health Centers, physician's offices and hospitals. Information obtained included: ability to perform pap smears and colposcopies, insurance accepted and where referrals were sent. The data collected from these interviews was mapped alongside population data from the Chicago Health Atlas evaluating socioeconomic status, race, cervical cancer mortality and incidence.

Summary of Results The analysis of the facilities show that 89% conduct pap smears, while only 56% perform colposcopies. In the review of the Chicago Health Atlas from 2012 to 2016, the highest rates of cervical cancer occur in Hispanic and African American women compared to Non-Hispanic white patients at an incidence of 12.1, 11.7 and 7.3 per 100,000 respectively. Initial geographic overlay of incidence rates showed higher cervical cancer incidence rates in regions without screening resources for colposcopy.

Conclusions While pap smears are available throughout Chicago, the availability of colposcopies is limited. This is likely another barrier to screening and treatment for cervical cancer. Our review suggests that the neighborhood of residence and accessibility to screening resources play a role in the disparities in cervical cancer diagnosis and treatment in Chicago.

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TRENDS OF PEDIATRIC HOSPITAL ADMISSIONS FOR ACUTE ASTHMA BETWEEN 2005–2019

A Chambers*, B Fassl, F Nkoy. University of Utah Health, Salt Lake City, UT

10.1136/jim-2021-WRMC.269

Purpose of Study Asthma is the most common chronic illness in the US, affecting 8% of children. Asthma exacerbations often result in hospitalization and significant healthcare costs. The purpose of this study is to describe the long-term trend in asthma admission rates over fifteen years at a tertiary care hospital following implementation of an asthma quality improvement project in the hospital, surrounding community, and state of Utah.

Methods Used The study took place at Primary Children's Hospital (PCH) in Salt Lake City, which is a tertiary care facility admitting 80–90% of asthma patients in the state of Utah. Starting in 2007, a multidisciplinary team consisting of clinicians, researchers, administrative stakeholders and representatives from the HMO (Intermountain Healthcare) implemented a series of asthma quality improvement interventions. This included a standardized inpatient care process model based on Joint Commission on Accreditation of Healthcare Organizations criteria, first implemented at PCH (2008–2010), then statewide across the Intermountain Healthcare system (2011–2013). Additional interventions consisted of a standardized inpatient-to-outpatient care transition program, Continuing Medical Education and Maintenance of Certification activities at PCH and affiliated Intermountain facilities, and

several research projects in clinics throughout the state to assist with managing chronic asthma control in the outpatient setting. We abstracted asthma admission rates and quality metrics from the hospital database that maintains a dedicated asthma registry and describe trends in annual admissions.

Summary of Results Between 2005 and 2019, 5344 patients were admitted to PCH for acute asthma with an annual average of 356 patients. Between 2005–2009 the annual admission average was 303 patients (range 247–450) per year, which subsequently increased to 472 (range 348–578) between 2010–2014 and then decreased to 294 (range 271–325) between 2015–2019. Compliance with evidence based asthma care measures remained >80% following implementation of the quality improvement program.

Conclusions Changes in pediatric asthma admissions over time may be associated with implementation of a comprehensive asthma quality improvement program across a health system.

271 HIP SURVEILLANCE FOR CHILDREN WITH WHAT? THE CONUNDRUM OF DIAGNOSIS

S Miller, J Coates*, K Mulpuri. *BC Children's Hospital, Vancouver, BC, Canada*

10.1136/jim-2021-WRMC.270

Purpose of Study Lack of a diagnosis of cerebral palsy (CP) has been identified as a barrier to enrollment in the Child Health BC Hip Surveillance Program for Children with CP. To overcome this barrier, children do not require a diagnosis of CP to be enrolled. This study aimed to investigate the diagnoses provided at the time of enrollment.

Methods Used All children enrolled in the program were included. Enrollment data related to a child's diagnosis and age were obtained. Chart notes from the province's only children's hospital, including those available from specialty clinics, inpatient records, and the hip surveillance program, were reviewed for all children enrolled without a diagnosis of CP to determine if a diagnosis of CP had been confirmed since enrollment. For those without a CP diagnosis, etiological diagnoses were compared to a list of conditions used in established CP registries.

Summary of Results Data from 959 children were reviewed. Based on population and prevalence rates, it is estimated this represents 42% of the expected number of children with CP in the province. Mean age at enrollment was 6.7 years (SD=4.2). The enrolling diagnosis was CP for 64.0% (614), possible CP for 12.5% (120), other for 22.7% (218), and no diagnosis for <1% (7). Chart review was completed for the 345 enrolled without a CP diagnosis. No charts were available for 19 children. A CP diagnosis was confirmed for 106 children, and 48 patients were identified as having a progressive condition not in keeping with the definition of CP. The diagnosis provided at enrollment was found in the list of CP conditions for 71 of 176 (40%) children that remained, while the remaining 105 had a variety of diagnosis, such as chromosomal abnormalities, developmental delay, seizure disorders, and syndromes, that could not be confirmed as CP.

Conclusions At enrollment, only 64.0% of children in surveillance were diagnosed with CP. While a large number of children were enrolled without a diagnosis of CP, enrollment remains well under the number of children expected. Lack of diagnosis may be a barrier to early enrollment and consequently a delay in detection of hip displacement.

272 HEALTHCARE RESOURCE UTILIZATION IN CHILDREN WITH CEREBRAL PALSY

^{1,2}M Juricic, ^{1,2}S Miller, ^{1,2}N Fajardo, ¹C Chapman, ¹J Coates, ¹E Habib, ^{1,2}E Schaeffer, ^{1,2}K Mulpuri. ¹BC Children's Hospital, Vancouver, BC, Canada; ²University of British Columbia, Vancouver, BC, Canada

10.1136/jim-2021-WRMC.271

Purpose of Study Cerebral palsy (CP) is the most common cause of motor impairment in children. Management involves care by medical/paramedical professionals and use of assistive devices. The purpose of this study was to learn about use and funding for health professionals and equipment accessed by children with CP.

Methods Used Caregivers of children with CP attending a pediatric orthopaedic clinic were invited to participate in an anonymous survey. Demographics, frequency of healthcare visits by provider, types of devices accessed, and how these services were funded were collected.

Summary of Results Surveys were completed by 234 caregivers of children across all Gross Motor Function Classification System (GMFCS) levels. Children at GMFCS IV/V and III/V were more frequently reported to have hospital admissions and emergency room visits, respectively. Children saw an average of 4.9(SD=1.5) medical professions and 3.4(SD=1.5) paramedical specialists. Total healthcare visits and professionals visited showed a trend towards increasing by GMFCS level. Total average annual visits with healthcare professionals was 78.8(SD=66), with children at GMFCS V reporting 107.4 (SD=83.1). Children at GMFCS III [82.3(SD=52.7)] and V [91.9 (70.8)] reported the highest number of paramedical visits. Funding was primarily government for physiotherapy (PT) at 79%(131/166) and for occupational therapy (OT) at 80% (133/166). Alternate funding for PT/OT included private insurance (18/7%), self-pay (23/7%), charity (5/5%), and others (8/12%). Caregivers most often reported including self-pay for orthoses and wheelchairs.

Conclusions Caregivers of children with CP reported a high number of annual visits with healthcare providers with a trend suggesting an increasing number of visits and providers with increasing GMFCS level. Funding for resources was often supplemented by families, suggesting a need for additional funding and services for children with CP.

273 CORRELATION OF RAIL SYSTEMS WITH LOWER TRAFFIC FATALITY RATES

K Abe*, L Yamamoto. *University of Hawaii John A. Burns School of Medicine, Honolulu, HI*

10.1136/jim-2021-WRMC.272

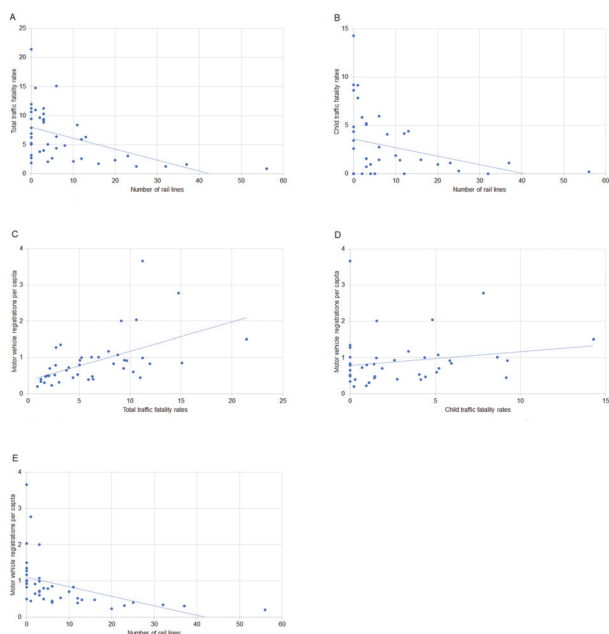
Purpose of Study Traffic fatality is a significant public health concern globally, and several factors may affect traffic fatality. We aimed to evaluate the relationship between rail systems and traffic fatalities and investigate whether this relationship contributes to the decrease in traffic fatality rates.

Methods Used Traffic fatality data, motor vehicle registrations, and rail lines of 34 U.S and 8 non-U.S cities from 2018 were obtained. Pearson correlation (linear regression) analyses were performed between all variables (figure 1).

Summary of Results The correlation coefficient (r) for rail systems (n=42) and total traffic fatality rates, child traffic fatality rates, and the number of motor vehicle registrations per capita were -0.49 (p<0.01), -0.31 (p<0.05), and -0.46 (p<0.01),

Abstract 273 Table 1

| Comparisons | R | R-square | P |
|--|-------|----------|-------|
| Number of rail line vs. Total traffic fatality rate | -0.49 | 0.24 | <0.01 |
| Number of rail line vs. Child total traffic fatality rate | -0.31 | 0.1 | <0.05 |
| Total traffic fatality rate vs. Motor vehicle registrations per capita | 0.54 | 0.29 | <0.01 |
| Child total traffic fatality rate vs. Motor vehicle registrations per capita | 0.18 | 0.03 | 0.24 |
| Number of rail line vs. Motor vehicle registrations per capita | -0.46 | 0.21 | <0.01 |



Abstract 273 Figure 1 Scatter plots and regression lines for each comparison

respectively, while the correlation coefficients for the number of motor vehicle registrations per capita and all traffic fatality and child traffic fatality rates were 0.54 ($p < 0.01$) and 0.18 ($p = 0.24$), respectively (table 1).

Conclusions A higher number of rail lines correlated with reduced traffic fatalities and lower numbers of motor vehicle registrations per capita.

274 IMPROVING ONCOLOGY EDUCATION FOR FAMILY MEDICINE RESIDENTS: HOW DOES BC COMPARE?

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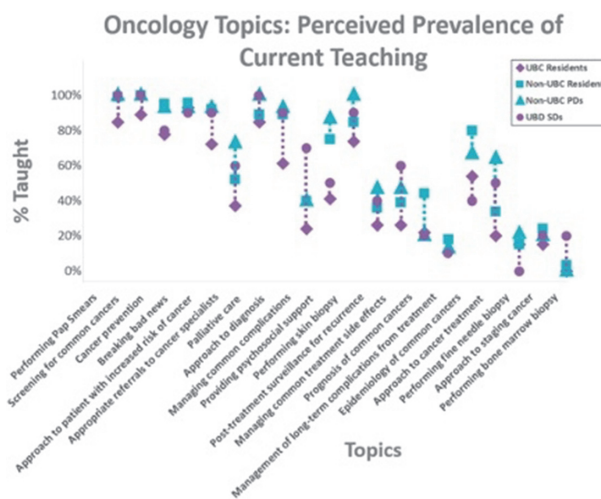
10.1136/jim-2021-WRMC.273

Purpose of Study Despite a rising incidence and prevalence of cancer in Canada, there are gaps in postgraduate medical curriculum related to oncology. Family medicine (FM) physicians provide a key role at all stages of the cancer journey and as such FM training programs should include relevant education. The purpose of our study was to assess the

current state of oncology education in the University of British Columbia (UBC) FM residency program. Results were compared to the same recently completed national Canadian FM residency program survey (CFMRSPS) that did not include UBC.

Methods Used A web-based survey, utilizing the previously conducted CFMRSPS, was distributed to 348 UBC FM residents (FMR) and 20 site directors (SD). The survey assessed presence of an oncology curriculum, current teaching methods and perceived gaps. Results were compared to CFMRSPS data (non-UBC) and interpreted with descriptive statistics.

Summary of Results 54/348 UBC FMR and 10/20 SD completed the survey. 3% of UBC and 7% of non-UBC FMR felt their program adequately prepared them to care for oncology patients. Between UBC FMR/SD and non-UBC FMR/SD there was uniformity in perceived importance of a list of oncology topics to be covered in training. There was discordance in the perceived frequency of topics taught between all FMR residents and SD. This discordance was more prominent in the BC data, than nationwide.



Abstract 274 Figure 1

Conclusions This study can inform further development of oncology specific curriculum in FM residency programs. Further study is required to understand areas of discordance between FMR and SD and across the country.

Neonatology general VI

Concurrent session

11:00 AM

Saturday, January 30, 2021

275 VANCOMYCIN USAGE OPTIMIZATION IN NEONATAL INTENSIVE CARE UNIT

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10.1136/jim-2021-WRMC.274

Abstract 275 Table 1

| Clinical Outcomes | Pre-guideline | Post-guideline | p-value |
|-----------------------------------|---------------|----------------|---------|
| Acute kidney injury n (%) | 1 (1.59) | 4 (3.31) | 0.496 |
| Blood stream infection n (%) | 5 (7.94) | 11 (9.09) | 0.792 |
| Respiratory tract infection n (%) | 6 (9.52) | 21 (17.36) | 0.154 |
| Urinary tract infection n (%) | 2 (3.17) | 8 (6.61) | 0.329 |
| Meningitis n (%) | 1 (1.59) | 2 (1.65) | 0.973 |
| Necrotizing enterocolitis n (%) | 1 (1.59) | 5 (4.17) | 0.352 |
| Mortality n (%) | 15 (23.81) | 17 (14.05) | 0.097 |

Purpose of Study Vancomycin is frequently used for empiric treatment in suspected late onset sepsis (LOS) in neonatal intensive care units (NICU), however, inappropriate or unnecessary use can lead to additional morbidities and emergence of drug resistance. Standardization and appropriate vancomycin utilization are imperative for safer patient care.

Methods Used This study was a part of qualitative improvement (QI) initiative to optimize vancomycin use in a level 4 NICU by introducing standardized LOS guideline with defined indications and criteria for empiric antibiotics. Implementation was started in 09/19 after completion of providers education. Periods evaluated were 12/18–03/19 (pre-guideline) and 12/19–03/20 (post-guideline). Data was retrospectively compared, including demographics, indications, days of therapy/1000 days (antibiotic utilization rate - AUR), cultures, isolated pathogens and resistance profiles. Clinical outcomes and adherence to the guideline were evaluated. Wilcoxon rank sum test was applied for continuous variables and Pearson chi-square test was applied for categorical variables. $p < 0.05$ was considered significant.

Summary of Results There were 63 LOS antibiotic courses given to 40 patients pre-guideline, and 121 courses in 63 patients in post-guideline period. We found a significant decrease in vancomycin AUR in the post-guideline period (76.56 in the pre-guideline vs 61.42 in the post-guideline; $p = 0.036$). Clinical outcomes and mortality within 30 days of antibiotic usage were not significantly different between two periods (table 1). Adherence to the LOS antibiotics guideline was 66.31%.

Conclusions Development of a standardized guideline for LOS evaluation and empiric antibiotic utilization resulted in reducing vancomycin AUR, while not negatively affecting clinical outcomes or morbidities. Further analysis is needed in order to identify factors contributing to unnecessary vancomycin use, as well as educational needs to ensure appropriate antibiotic use overall.

exclusive human milk (EHM) versus bovine milk based fortifier (HMF) after reaching full enteral feeding and off parenteral nutrition or intravenous fluids.

Methods Used Retrospective study on preterm infants less than 1250 g at birth admitted to NICU from January 2016 to November 2019 who were fed EHM-26cal/oz (carbohydrate: 0.0774 g/ml) or HMF-24cal/oz (carbohydrate: 0.085 g/ml). Demographics, BG levels, diagnosis of hypoglycemia (BG ≤ 60 mg/dL) and need for intervention were collected. Full enteral feeding was defined as 120 cc/kg/d of tolerated enteral feedings for at least 72 hours. Chi square test, Wilcoxon rank sum and linear regression were used for data analysis.

Summary of Results Eighty-nine preterm infants were included in the study. Infants fed EHM had lower gestational age. The median (25th,75th percentile) minimum BG values in mg/dL within 72 hours of full feeding was significantly lower in EHM group (61 (50,66) vs HMF 71 (59,77); $p = 0.002$). The diagnosis of hypoglycemia was not significantly different between the two groups (EHM 28/59 (47.7%) vs. HMF 9/30 (30%), $p = 0.20$). (Table 1) Ten infants who developed hypoglycemia required intervention (EHM group 8/10 vs. HMF 2/10). Regression analysis showed that lower BG levels were significantly associated with EHM ($p = 0.017$) after adjustment of confounders.

Abstract 276 Table 1 Demographics and outcomes of study population

| Demographics & Outcomes | EHM (N=59) | HMF (N=30) | p value |
|---------------------------------------|------------------|-------------------|---------|
| Birth weight (grams)* | 935 (730, 1110) | 994.5 (760, 1145) | 0.32 |
| Gestational age (weeks)* | 26.86 (25, 28.1) | 27.855 (27, 30.3) | 0.02 |
| Male n (%) | 23 (39) | 15 (50) | 0.32 |
| SGA n (%) | 6 (10.2) | 6 (20) | 0.20 |
| Days to reach full enteral feeding ** | 29 (18, 41) | 30 (20, 44) | 0.46 |
| Minimum Blood Glucose (mg/dL)** | 61 (50, 66) | 71 (59, 77) | 0.002 |
| Hypoglycemia within 72H n (%) | 28 (47.5) | 9 (30) | 0.11 |

*median (25th percentile, 75th percentile)
**Variable with different denominator

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DIFFERENCES IN BLOOD GLUCOSE LEVELS IN PRETERM INFANTS LESS THAN 1250 GRAMS AT BIRTH FED EXCLUSIVE HUMAN MILK OR BOVINE MILK BASED FORTIFIED HUMAN MILK

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10.1136/jim-2021-WRMC.275

Purpose of Study Comparison of blood glucose (BG) levels in preterm infants less than 1250 grams at birth fed with

Conclusions BG levels in preterm infants less than 1250 grams were significantly lower when fed exclusive human milk potentially because of its slightly lower carbohydrate content. However, the rate of hypoglycemia was not significantly different between the two groups. BG levels should be continuously monitored in preterm infants fed EHM once off parenteral nutrition or intravenous fluids. Our findings need to be verified with larger sample size.

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EFFECTS OF POSTNATAL STEROIDS ON NEURODEVELOPMENTAL OUTCOMES IN PRETERM INFANTS

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10.1136/jim-2021-WRMC.276

Purpose of Study To determine if the use of postnatal steroids in premature infants is a risk factor for poor neurodevelopmental outcomes.

Methods Used Retrospective review of all premature infants <1250 grams at birth seen at high risk infant follow up clinic at LAC+USC Medical Center. Infants with magnetic resonance imaging (MRI) of the brain and measurement of brain volume (BV) included. Infants followed at 18 months corrected age (CA) and at 3 years with Bayley Scales of Infant and Toddler Development Third Edition to assess for cognitive, motor, and language skills as well as social-emotional scoring based on parental report. Infants divided into two groups: those who received steroids (hydrocortisone and/or dexamethasone) and those who did not. Data analyzed using Kruskal-Wallis and Chi Square and linear regression.

Summary of Results Forty-eight infants followed up at 18 months while 28 followed up at 3-years old. Infants who received postnatal steroids (PS) were smaller, immature and with neonatal morbidities (table 1). The composite scores in cognitive, language, and motor skills at 18-months CA were significantly lower in infants receiving PS. However, lower composite scores persisted only in motor skills at 3 years of age (table 2). After adjustment of confounders, the use of PS negatively affected the motor composite score (Coef. -13.76; 95% CI -24.95, -2.57, $p=0.02$).

Conclusions The use of postnatal steroids did not significantly affect brain volume; however, its use negatively impacted the composite motor score in preterm infants. Judicious use of PS is important when caring for these infants. Early intervention should be started as soon as infants are stable.

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QUALITY IMPROVEMENT INITIATIVE TO IMPROVE PATIENT CARE FOR NEONATAL ABSTINENCE SYNDROME

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10.1136/jim-2021-WRMC.277

Purpose of Study Almost 100 babies are born in U.S. every single day suffering from in-utero substance exposure. Some will experience neonatal abstinence syndrome (NAS) through fussiness, irritability, excoriating skin, difficulty sleeping, eating, and even growing. Pharmacological interventions are often required to manage symptoms. We initiated a quality improvement (QI) project to improve patient care for babies with NAS through a multiprong approach.

Methods Used Using the Plan-Do-Study-Act (PDSA) approach, we analyzed our inpatient data by doing retrospective chart review of newborns with history of in-utero drug exposure. After understanding our population, a new management algorithm was implemented to standardize screening criteria, non-pharmaceutical interventions, and pharmaceutical interventions using morphine— both escalation and de-escalation with a commitment to complete inpatient wean when possible.

Summary of Results In 2019, a total of 48 neonates had in-utero substance exposure [28 males, 20 females, birth gestational age 28–41 weeks], of which 20/48 (42%) had opiate exposure. Of the total 48 infants, 15 (31%) required pharmacological treatment using either methadone or morphine, at the discretion of the provider. Sixty-seven percent (10/15) of treated infants were discharged on opioids to complete a wean outpatient; only 5 infants completed treatment inpatient. The average inpatient length of treatment (LOT) for these 5 infants was 14 days. The remaining 10 infants who completed an outpatient wean, experienced an average outpatient LOT of 66 days. The average LOT for the treated infants weaned inpatient and outpatient was 53 days with an average LOS of 24 days.

After implementing the new management algorithm, three patients met criteria for treatment. The average inpatient

Abstract 277 Table 1 Demographics and outcomes

| | Birth weight (grams)* | Gestational age (weeks)* | Treated retinopathy of prematurity, n (%) | Necrotizing enterocolitis, n (%) | Bronchopulmonary dysplasia, n (%) | Intracranial hemorrhage, n (%) | Brain volume (mm3)* |
|------------------------------------|-----------------------|--------------------------|---|----------------------------------|-----------------------------------|--------------------------------|---------------------|
| No steroids (n=55) | 925 (808, 1030) | 28 (27, 30) | 0 | 4 (7) | 25 (45) | 20 (36) | 315 (295, 338) |
| Received postnatal steroids (n=47) | 662.5 (557.5, 793) | 25.3 (24.3, 26.5) | 25 (35) | 6 (8) | 67 (93) | 56 (78) | 315 (290, 361) |
| P-value | <0.001 | <0.001 | <0.001 | 1.00 | <0.001 | <0.001 | 0.54 |

Abstract 277 Table 2 Neurodevelopmental outcomes between groups

| | 18mo CA: Cognitive* | 18mo CA: Language* | 18mo CA: Motor* | 18mo CA: Social* | 3yo: Cognitive* | 3yo: Language* | 3yo: Motor* | 3yo: Social* |
|------------------------------------|---------------------|--------------------|-----------------|------------------|-----------------|----------------|-------------|--------------|
| No postnatal steroids (n=11) | 95 (85, 100) | 83 (77, 94) | 94 (82, 100) | 100 (85, 110) | 90 (90, 90) | 83 (79, 91) | 91 (82, 94) | 90 (80, 105) |
| Received postnatal steroids (n=17) | 80 (75, 90) | 77 (71, 83) | 88 (76, 94) | 90 (85, 95) | 90 (85, 90) | 79 (71, 83) | 73 (73, 85) | 80 (75, 85) |
| P-value | 0.004 | 0.047 | 0.02 | 0.14 | 0.16 | 0.07 | 0.003 | 0.05 |

*Median (25th percentile, 75th percentile)

LOT decreased from 14 days to 11 days, with all patients completing pharmacologic treatment during their inpatient stay. The average LOS decreased by 25%, from 24 days to 18 days.

Conclusions In our institution, using an algorithm for management of NAS shows promise in decreasing length of pharmacological treatment while simultaneously decreasing length of hospital stay for infants who show signs and symptoms of drug withdrawal.

279 BENEFITS OF DELAYED CORD CLAMPING IN PRETERM INFANTS AT 23–28 WEEKS OF GESTATION AT BIRTH

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10.1136/jim-2021-WRMC.278

Purpose of Study To compare short-term outcomes in preterm infants 23–28 weeks of gestation exposed to delayed cord clamping (DCC) vs. immediate cord clamping (ICC).

Methods Used This is a retrospective study of all preterm infants born at 23–28 weeks of gestation at LAC+USC Medical Center between 2016–2020. Demographics, DCC and clinical data were extracted from electronic medical records and the neonatal database. Data was analyzed with Chi-Square or Fischer Exact test and Wilcoxon Rank Sum test.

Summary of Results Fifty-three infants met inclusion criteria. Majority of infants 39/53 (74%) were in the ICC group. The median gestational age, birth weight and hemoglobin at 24 hours of life in infants with DCC

were significantly higher. These infants received fewer packed red blood cell transfusions with the first occurring at a later day of postnatal life. The rate of intraventricular hemorrhage and necrotizing enterocolitis was not different between the groups, but the rate of hypotension requiring vasopressors was lower in infants with DCC. (Table 1) No infant suffered from hypothermia in the DCC group.

Conclusions Our preliminary findings show that DCC is beneficial in this preterm population. It is imperative to perform DCC whenever possible, especially in the smallest and most immature infants. Larger sample size is needed to confirm our findings.

280 NICU CLINICIANS' PERSPECTIVE ON TELEPHONE COMMUNICATION WITH PARENTS: A QUALITATIVE STUDY

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10.1136/jim-2021-WRMC.279

Purpose of Study During a NICU hospitalization, it is impossible for parents to always be at the infant's bedside; resulting in medical updates occurring via telephone. As telephone communication is inevitable within this setting, it is important to understand the experience of clinicians and families in this modality of conversation.

Methods Used We had a purposeful sample of 3 nurses, 4 residents, and 2 nurse practitioners and explored barriers and facilitators to telephone communication in the NICU. Interviews followed a semi-structured guide covering topics such as content and reason of calls, connectedness with parents, and comfort discussing difficult issues. All interviews were conducted in-person by a NICU fellow, were recorded, and transcribed. Two investigators independently coded all transcripts with Dedoose qualitative software, using a phenomenological approach. Codes were reviewed by a third researcher who helped resolve disputes, review the coding scheme, and collapse codes into major themes.

Summary of Results Six themes and 24 sub-themes emerged from the transcripts. The themes were: pre-work before a call, barriers to calls, downsides of telephone calls, phone call logistics, other ways to update families, and ways to improve calls. Some of the subthemes for these categories include: one-sided communication, workload, difficulty comforting on the phone, and no standardization of calls. Please see table 1 for the sub-themes and representative quotes for each theme.

Conclusions Communicating with an infant's family is challenging to do over the telephone. Given the heterogeneity and lack of training, next steps include standardized call guidelines and a document to set family call expectations. Video calls and text messages could add more visual forms of communication and providing protected time could help the workload barrier.

Abstract 279 Table 1 Demographics and outcomes

| | Immediate Cord Clamping N = 39 | Delayed Cord Clamping N = 14 | P Value |
|---|-----------------------------------|---------------------------------|---------|
| Gestational age (weeks)* | 26 (25, 26) | 27.5 (27, 28) | <0.001 |
| Birth weight (g)* | 775 (725, 975) | 1057.5 (885, 1180) | 0.001 |
| Male sex n(%) | 15 (41) | 7 (50) | 0.75 |
| Vaginal delivery n(%) | 9 (23.1) | 8 (57.1) | 0.04 |
| Admission Temperature (°C)* | 36.7 (36.6, 37.1) | 36.9 (36.8, 37.2) | 0.38 |
| Hemoglobin at 24 hours of life (g/dL)* | 13.9 (12.9, 15.7) | 16.3 (15.1, 17.7) | 0.02 |
| Transfusion at 24 hours of life n (%) | 13 (33.3) | 1 (7.1) | 0.08 |
| Day of life of transfusion* | 3 (1, 7) | 5 (2, 21) | 0.11 |
| Number of transfusions* | 6 (4, 9) | 3 (1, 5) | < 0.001 |
| Hypotension requiring vasopressors n(%) | 21 (53.8) | 2 (14.3) | 0.01 |
| Intraventricular Hemorrhage n (%) | 24 (61.5) | 6 (42.9) | 0.67 |
| Necrotizing Enterocolitis n(%) | 3 (7.7) | 1 (7.1) | 1.00 |

*median(25th percentile, 75th percentile)

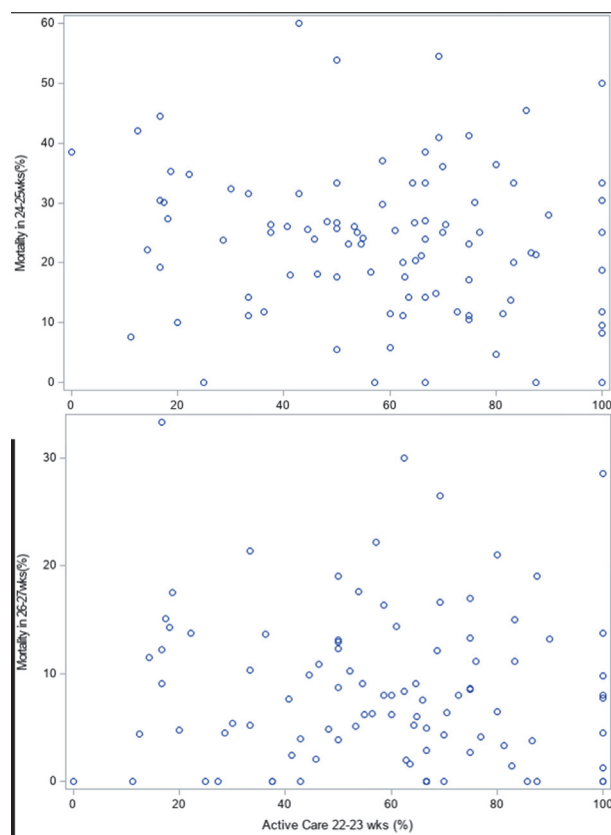
Abstract 280 Table 1

| Theme | Representative Quotation |
|---|--|
| Subtheme | |
| PRE-CALL WORK | |
| Recognizing that families have different needs | 'That's not a typical question I ask...I feel like there are some parents who want to be called in the middle of the night if their baby has a spell in the middle of a spell count down. But, no I haven't asked that.' |
| Not asking parents directly what they want | |
| Prepping before a phone call | |
| Reasons providers call in the middle of the night | |
| BARRIERS TO CALLS | |
| Workload | 'It's definitely the one that always slips to the end of the day for me, especially when things are busy or if we're trying to help out with more active, sicker patients.' |
| Phone call are no longer the norm | |
| Can't get ahold of a family member | |
| Some conversation are time consuming | |
| DOWNSIDES TO TELEPHONE CALLS | |
| One - sided communication | 'You can get a little bit about 'are they understanding what I am saying', 'are they nodding', 'are they processing', or 'is this going over someone' head and they are panicked?' |
| Having a 'speal' | |
| Lack of non-verbals to gauge emotion | |
| Calling at inconvenient times | |
| Can't easily comfort on the phone | |
| No standardization of phone calls | |
| Poor rapport | |
| Attending to babies while on the phone | |
| PHONE CALL LOGISTICS | |
| Knowing when the last update was | 'It's just hard because we never know when you last talked to them and you probably never know when we last talked to them.' |
| Missed call anxiety from parents | |
| Not calling a family | |
| OTHER WAYS TO UPDATE FAMILIES | |
| Interest in sending text messages | 'I've had so many parents ask me if I can send them photos of their baby while they're gone for the weekend. It's so hard to say 'no' and you just have to be very delicate about everything.' |
| Using video calls | |
| Having a NICU live feed | |
| WAYS TO IMPROVE CALLS | |
| Building rapport on the phone | 'Sometimes I will comment on the baby in a non-medical way like 'oh, your baby is so cute, he opened his eyes today. He's acting hungry'. Little things like that that I think parents enjoy hearing.' |
| Selling expectations | |

outcomes for extremely preterm infants at older gestational ages.

Methods Used A population-based cohort of infants born during 2014–2018 at 22–27 weeks (n=8635) in 96 California Perinatal Quality Care Collaborative (CPQCC) hospitals was included (inborn only). Active care was defined as receiving surfactant, ventilation, epinephrine, or cardiac compressions. Correlation was assessed between rates of active care in 22–23 week infants and outcomes in infants born at 24–25 and 26–27 weeks (mortality and survival without comorbidities).

Summary of Results Hospital rates of active care in 22–23 week infants (median: 61%, IQR: 29%) were not correlated with mortality or survival without morbidity among infants born at 24–25 or 26–27 weeks (range of correlation coefficients: -0.02 to -0.13, $p > 0.1$; figure 1). The most common comorbidity was chronic lung disease in 24–27 week infants (39%).



Abstract 281 Figure 1 Comparison of rates of active care in infants born at 22–23 weeks and mortality in older infants

Conclusions Hospitals that more frequently pursue intensive care for infants born at 22–23 weeks do not necessarily experience improved outcomes for extremely preterm infants at older gestational ages.

281 ACTIVE CARE AT 22–23 WEEKS AND HOSPITAL OUTCOMES OF MORE MATURE INFANTS IN CALIFORNIA, 2014–18

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10.1136/jim-2021-WRMC.280

Purpose of Study To determine if hospitals with higher rates of active care for infants born at 22–23 weeks have better

282 IMPACTS OF DELIBERATE PRACTICE SIMULATION ON NEONATAL OUTCOMES

M Nguyen*, I Purdy, M Leng, J Enciso. University of California Los Angeles, Los Angeles, CA

10.1136/jim-2021-WRMC.281

Purpose of Study There is no current data to show that simulation based deliberate practice in Neonatal Resuscitation Program (NRP) training improves patient outcomes. We hypothesize that NRP simulation, using deliberate practice, can improve patient outcomes and NRP performance.

Methods Used The project design consisted of a prospective pre- and post-intervention study at a 22-bed, level IV neonatal intensive care unit (NICU). Nine neonatal-perinatal medicine fellows completed a boot camp followed by 2–6 in situ mock codes. The boot camp served as a baseline level of performance, and the subsequent in situ mock codes provided repetitive opportunities for practice and evaluation of NRP performance. Resuscitations of 734 infants and resuscitations of 697 infants, who were born at the hospital and admitted into the NICU, were reviewed and gathered in baseline and prospective databases, respectively.

Summary of Results There were no differences in NRP performance (adherence scores, mean=4.98, $p=0.18$) between the 2 groups. The post-intervention group had more infants with major congenital anomalies (20.44% vs 75.04%, $p=0.04$). There were no differences in patient outcomes: death within 12 hours (0.41% vs 1.29%, $p=0.07$), length of stay ($p=0.63$), disposition (death, discharge home, or transported) from the hospital ($p=0.23$), and hypoxic ischemic encephalopathy (1.89% vs 2.81%, $p=0.40$). The post-intervention group had more complex resuscitations (41.01% vs 54.23%, $p<0.0001$) requiring positive pressure ventilation (PPV) (25.48% vs 32.28%, $p=0.01$) and intubation (6.4% vs 9.61%, $p=0.03$).

Conclusions There was no performance decay over time which showed that deliberate practice maintained NRP skills. The need for more complex resuscitation could be due to the increased number of infants with major congenital anomalies in the post-intervention group. The increased use of PPV and intubation in the post-intervention group could imply effective resuscitation skills emphasizing effective ventilation. Patient outcomes were not worse in the post-intervention group, despite the fact that it had more infants with major congenital anomalies. Our data suggest that deliberate practice has value in maintaining optimal NRP performance and patient outcomes.

Cardiovascular, nephrology and hypertension concurrent session

1:00 PM

Saturday, January 30, 2021

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AGE-SPECIFIC ASSOCIATION BETWEEN STANDING HEIGHT AND PULSE PRESSURE IN ADULTS

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10.1136/jim-2021-WRMC.282

Purpose of Study While standing height is positively associated with blood pressure in the pediatric population, studies have suggested an inverse association in adults. We sought to determine whether age modified the association between standing height and hypertension (HTN) and pulse pressure (PP).

Methods Used The study included 11,807 adults ≥ 20 years not taking antihypertensives and without history of cardiovascular disease. Standing height was categorized into sex-specific quartiles (male: <168.9, 168.9–174.1, 174.1–179.3, ≥ 179.3 cm; female: <155.6, 155.6–160.7, 160.7–165.5, ≥ 165.5 cm). HTN was defined as BP $\geq 130/80$, and elevated PP was defined as PP ≥ 55 mmHg. We estimated odds ratios (OR) using logistic regression, adjusting for covariates, accounting for the complex survey design, and stratifying by 10-year age groups.

Summary of Results Among the 11,807 adults, 24% had elevated PP and 26% had HTN. Those in the highest quartile (Q4) of height were younger, had greater waist circumference, and had lower proportions of microalbuminuria and diabetes compared to those in the lowest quartile (Q1). Those in Q4 had 15% lower unadjusted odds of HTN compared to Q1, losing significance after adjustment (OR [95% CI]: unadjusted OR = 0.85 [0.74, 0.98], adjusted OR = 1.12 [0.95, 1.32]). Stratifying by race/ethnicity revealed 60% higher adjusted odds of HTN in Hispanics (Q4 vs. Q1; adjusted OR = 1.60 [1.14, 2.23]) but not non-Hispanic Whites or Blacks. Those in Q4 had 21% lower adjusted odds of elevated PP compared to Q1, (unadjusted OR: 0.61 [0.51, 0.73], adjusted OR: 0.79 [0.65, 0.95]). These lower odds of elevated PP were evident only in non-Hispanic Whites. When stratifying by 10-year age groups, odds of elevated PP significantly decreased with increasing age up to 70 years (Q4 vs. Q1; ‘20–29 yrs’: 1.19 [0.9 1.57], ‘30–39’: 1.12 [0.80, 1.55], ‘40–49’: 0.92 [0.57, 1.46], ‘50–59’: 0.62 [0.39, 0.99], ‘60–69’: 0.31 [0.19, 0.52], ‘70+’: 0.57 [0.32, 1.00]; P-trend <0.001).

Conclusions Standing height was found to be negatively associated with HTN and elevated PP, especially in older adults ≥ 50 years; however, there exist differences among race/ethnicities. The association with PP and significance in older adults may suggest that age-related arterial stiffness plays an important role.

284

UNDERSTANDING ACCESS TO HEALTHY OPTIONS IN FOOD BANKS AS PART OF COMMUNITY-BASED CHRONIC DISEASE PREVENTION AND MANAGEMENT EFFORTS

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10.1136/jim-2021-WRMC.283

Purpose of Study Food insecurity is a major public health issue in the United States associated with increased chronic disease burden and negative health outcomes. Studies show adults with very low food security are 42% more likely to have hypertension compared to adults in food-secure households. Traditionally, food banks have offered shelf-stable, calorie dense, high sugar and salt foods. Recently, food pantries have aimed to provide more nutritious food options to their clients. The purpose of this study is to describe current attitudes and practices of food bank staff regarding access to and promotion of healthy foods and nutrition education.

Methods Used

This study consisted of a cross-sectional, anonymous online survey and semi-structured interviews with staff from a network of food banks that operate mobile food pantries in the United States.

Summary of Results Staff from 16 of 32 eligible food banks (50%) responded to an electronic survey. Five survey respondents went on to complete an interview. A large proportion of responding pantries (81%) reported always or almost always offering a wide variety of fresh produce during distributions. Fewer pantries always or almost always encourage whole-grain over refined-grain products (44%) and offer three or more kinds of canned food without added sugar (31%) or added salt (25%). Half of responding sites have a formal policy on the types of food they will accept (50%), with one-fourth only accepting food considered healthy (25%). Challenges related to food donations that were identified during the interviews included difficulty with determining what could be done with ‘unhealthy’ food donations, and the fact that national partnerships can make it difficult to turn away food. Half of responding pantries always or almost always offer recipes and cooking tips, but few (6–13%) routinely employ more active education techniques, such as tastings, cooking demos or ‘walk-the-line’ nutrition education. 75% want to do more nutrition education.

Conclusions There is some evidence that mobile food pantries are stocking and promoting healthy foods, but more support is needed around managing the donation process, offering whole grains and canned foods without added sugar and salt, and developing interactive nutrition education activities.

285 DOES LIVER SURFACE NODULARITY CONTRAINDICATE HEART TRANSPLANT?

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10.1136/jim-2021-WRMC.284

Purpose of Study The criteria for combined heart-liver transplant (HL) has not been well established. Liver cirrhosis in a heart failure patient would require consideration for HL. Investigators have used (NIT) such as ultrasound and CT scans to assess for liver surface nodularity which suggests cirrhosis. Biopsies are then performed to assess for liver disease. However, pathology findings can be heterogeneous and therefore the biopsy may not be reliable to exclude cirrhosis due to sampling error. It is not known whether abnormal NIT suggesting cirrhosis alone renders poor outcome if heart transplant (HTx) proceeds.

Methods Used Between 2012 and 2017, we identified 24 patients with an abnormal NIT demonstrating liver surface nodularity suggestive of cirrhosis. Patients had liver biopsies without cirrhosis by pathology. Of these 24 patients, the worst pathology finding was seen in only 3 patients who had 3–4+ fibrosis. Study endpoints included 3-year survival, freedom from non-fatal major adverse cardiac events (NF-MACE: MI, CHF, PCI, ICD implant, stroke), and freedom from cardiac allograft vasculopathy (CAV, defined by stenosis $\geq 30\%$). Freedom from 1-year rejection [acute cellular rejection (ACR), antibody-mediated rejection (AMR)] was also recorded. We compared these 24 patients to patients who underwent HTx without liver disease (n=523) during this same time period.

Summary of Results Patients who had liver nodularity with HTx had similar 3-year survival, freedom from NF-MACE, and freedom from CAV compared to control patients who had HTx without liver disease. Furthermore, 1-year freedom

Abstract 285 Table 1

| Endpoints | Heart Transplant Control (n=523) | Nodular Liver without Cirrhosis (n=24) | P-value |
|-----------------------------|----------------------------------|--|---------|
| 3-Year Survival | 85.1% | 95.8% | 0.148 |
| 3-Year Freedom from CAV | 91.0% | 95.8% | 0.347 |
| 3-Year Freedom from NF-MACE | 82.4% | 91.7% | 0.240 |
| 1-Year Freedom from ACR | 94.1% | 91.7% | 0.669 |
| 1-Year Freedom from AMR | 95.0% | 91.7% | 0.479 |

from rejection was similar between study groups (see table 1). The 3 patients with 3–4+ fibrosis on liver biopsy were survivors.

Conclusions In our single center experience, surface nodularity suggesting cirrhosis by NIT without confirming liver biopsy of cirrhosis does not appear to be a contraindication to proceed with HTx alone.

286 THE CORRELATION BETWEEN EXECUTIVE FUNCTION AND COPING MECHANISMS IN INDIVIDUALS WITH CONGENITAL HEART DEFECTS

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10.1136/jim-2021-WRMC.285

Purpose of Study Adults with congenital heart defects (CHD) are more likely to exhibit executive dysfunction and have psychiatric disorders when compared to the general population, yet they are less likely to be diagnosed. Literature suggests the etiology of the psychiatric diagnosis in CHD patients is inconclusive. The lack of understanding of this population’s psychiatric deficits is a probable factor affecting why psychiatric comorbidities are underdiagnosed in individuals with CHD. This is a growing concern due to an increasing number of adults who are currently living with CHD.

Methods Used Individuals were eligible for this mixed methods pilot study if: (1) diagnosed with CHD; (2) 18–24; (3) experienced extended hospital stays, open heart surgery, or other genetic conditions. We assessed risk for various factors contributing to psychiatric disorders including autism, executive functioning, sense of coherence, sleep and fatigue issues, depression, anxiety, parental style, and coping mechanisms. We compared scales, interviews, and medical record data checking for concordance across all modalities.

Summary of Results We received surveys from 7 individuals. The sample was 28% male and 57% Hispanic. All participants reported self-control and initiative executive function deficits >2 s.d. above normal. An average of 55% (range 42% - 62%) of their coping strategies were considered negative, 42% showed risk for anxiety, 28% for depression, and 57% for fatigue; only 2 participants had been diagnosed with mental health concerns. Interviews (N=4) revealed that participants demonstrated poor executive functioning and an overinflated sense of coherence making them likely to engage in negative coping mechanisms when a life stressor occurred.

Conclusions This study provides a model to explain the etiology of mental health issues in CHD patients. This study suggests a need for a large-scale investigation of the psychological

health in individuals with CHD, a rapidly growing population whose quality of life may be detrimentally affected by psychiatric comorbidity. Recruitment is ongoing to ensure results are representative.

287 HIGH INCIDENCE OF OBSTRUCTIVE SLEEP APNEA AMONG PATIENTS REFERRED FOR ATRIAL FIBRILLATION ABLATION DIAGNOSED BY ACTIVE SCREENING

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10.1136/jim-2021-WRMC.286

Purpose of Study We sought to determine undiagnosed OSA and risk factors in patients referred to tertiary care center for AF ablation.

Methods Used Through a retrospective, single center analysis we assessed patients screened for OSA then compared the groups with and without known OSA for comorbidities and risk factors that included age, sex, HTN, T2DM, CVD, stroke/TIA, CHF, CHADS2VASC score and BMI.

Summary of Results Patients presenting for ablation of AF (n=109, age 67 + 8.5 yrs, 40% female, 72% HTN, 17% T2DM, 22% CVD, 17% stroke/TIA, 29% CHF) were evaluated for OSA by symptom screening including, daytime somnolence, fatigue, snoring, witnessed apnea and known HTN. During the referral, OSA history was present in 42 patients (38.5%). Epworth score was documented in 43 patients- mean 4.76 + 5.01. Formal STOP BANG documentation was only noted in nine patients (mean 4.4 + 2.3). Fifty-five patients with and without OSA underwent a sleep study. AHI during the sleep study was 38 + 35 vs 10.7 + 13.8 (p=0.001), respectively. Of 66 patients without a past history of OSA, (n=18) 26.7% screened positive, with final diagnosis of OSA in 52%. Patients who screened positive had a higher BMI than those who had not 30 + 4 vs 27.3 + 3.2 (p=0.01). There was no difference in other demographics or comorbidities.

Abstract 287 Table 1 Baseline characteristics of patients referred for AF ablation (n=109)

| | |
|--------------------|-----------|
| Age (yrs) | 67 + 8.5 |
| Sex (female%) | 40 |
| Hypertension (%) | 72 |
| Diabetes (%) | 17 |
| CVD (%) | 22 |
| Stroke/ TIA (%) | 17 |
| CHF | 29 |
| CHADS 2 VASC score | 2.7 + 1.5 |
| BMI | 30 + 5.3 |
| PeAF (%) | 67.7 |

Abstract 287 Table 2 Comparison of those with and without presenting diagnosis of OSA

| | Past history of OSA | Without Past history of OSA | P value |
|------------------|---------------------|-----------------------------|---------|
| Age | 68 + 8.9 | 66 + 8.2 | ns |
| Sex (%) | 45 | 38 | ns |
| BMI | 33.2 + 6.1 | 28 + 3.6 | <0.0001 |
| Hypertension (%) | 71 | 72 | ns |
| Diabetes (%) | 18 | 16 | ns |
| CHF (%) | 31.5 | 27.8 | ns |
| CVD (%) | 26.3 | 19.7 | ns |
| CHADS2VASC score | 2.9 + 1.5 | 2.5 + 1.6 | ns |
| PAF/PeAF (%) | 71 | 65.5 | ns |

Conclusions Undiagnosed OSA might be risk factor for AF even among those with BMI < 30. Active clinical screening is recommended.

288 DOES TIMING OF RENAL DYSFUNCTION AFTER HEART TRANSPLANT RESULT IN WORSE OUTCOMES?

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10.1136/jim-2021-WRMC.287

Purpose of Study Chronic kidney disease after heart transplantation is not uncommon due to the nephrotoxicity of calcineurin inhibitors (CNIs). It is well established that kidney dysfunction does impact post-transplant survival. What is not known is whether early or later development of kidney dysfunction has greater impact on outcomes.

Methods Used Between 2010 and 2017, we assessed 149 heart transplant patients and followed their course over the first 5 years. Patients were categorized as having kidney dysfunction detected with creatinine > 1.5 mg/dL at 1-year, 3-years, and 5-years after heart transplant. These patients were subsequently followed for 5 years to assess for subsequent 5-year survival, subsequent 5-year freedom from non-fatal major adverse cardiac events (NF-MACE: MI, new CHF, PCI, ICD implant, stroke), subsequent 5-year freedom from cardiac allograft vasculopathy (CAV, as defined by stenosis ≥30%),

Abstract 288 Table 1

| Endpoints | Creatinine > 1.5 mg/dL @ 1-Year (n=112) | Creatinine > 1.5 mg/dL @ 3-Year (n=31) | Creatinine > 1.5 mg/dL @ 5-Year (n=6) | P-value |
|---|---|--|---------------------------------------|---------|
| Subsequent 5-Year Survival | 74.1% | 77.4% | 100.0% | 0.425 |
| Subsequent 5-Year Freedom from CAV | 82.1% | 90.3% | 100.0% | 0.360 |
| Subsequent 5-Year Freedom from NF-MACE | 75.9% | 74.2% | 100.0% | 0.427 |
| Subsequent 5-Year Freedom from LV Dysfunction | 87.5% | 87.1% | 100.0% | 0.659 |
| Patients on Kidney Dialysis | 33.9% | 16.1% | 0.0% | 0.043 |
| Patients with Worsening Kidney Function (development of creatinine > 2.0 mg/dL) | 65.2% | 61.3% | 50.0% | 0.715 |

and 5-year freedom from left ventricular dysfunction (LVEF \leq 40%).

Summary of Results Patients who developed kidney dysfunction at 1 year post-heart transplant appear to have similar subsequent survival compared to those at 3 and 5 years after heart transplant. However, significantly more patients at 1-year required kidney dialysis. Subsequent 5-year freedom from NF-MACE and CAV were similar amongst all 3 study groups.

Conclusions Early development of kidney dysfunction appears to lead to more patients needing kidney dialysis compared to those patients that develop kidney dysfunction later post-heart transplant. Renal sparing protocols or CNI minimization should be aggressively approached in these early patients to prevent worsening of kidney dysfunction.

289 EFFECTS OF DONOR AGE ON HEART-KIDNEY TRANSPLANTATION IN OLDER RECIPIENTS

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10.1136/jim-2021-WRMC.288

Purpose of Study Heart-kidney transplantation is limited by donor availability, and further limited by donor age. The ISHLT registry has suggested increased risk of mortality with the use of older donors. Research has similarly suggested that older recipients have less favorable outcomes. However, it is not well established if older donors into older recipients have acceptable post-transplant outcomes. Therefore, we sought to answer this question in our large single center program.

Methods Used Between 2010 and 2018, we assessed 50 heart-kidney transplant patients 60 years of age and older. We divided those into patients having donors greater than 50 years of age, 40 to 49 years of age, and less than 40 years of age. 5-year survival, freedom from cardiac allograft vasculopathy (CAV, as defined by stenosis \geq 30%), and freedom from non-fatal major adverse cardiac events (NF-MACE: myocardial infarction, new congestive heart failure, percutaneous coronary intervention, implantable cardioverter defibrillator/pacemaker implant, stroke) were assessed. Freedom from 1-year rejection [acute cellular rejection (ACR), antibody-mediated rejection (AMR)] was also evaluated.

Summary of Results Older heart-kidney transplant patients who received older donor organs appeared to have greater freedom

from CAV at 5 years, although the number of patients is small. 5-year survival and freedom from NF-MACE were similar with all donor age groups. 1-year freedom from rejection was also similar among all the three donor age groups (see table 1).

Conclusions Older donors appear to be acceptable in older heart-kidney transplant recipients. The use of older donors may enable more patients to undergo these life-saving surgeries.

290 CLOSTRIDIUM DIFFICILE IN POST-HEART TRANSPLANT RECIPIENTS: IS THERE AN IMMUNE MODULATORY EFFECT?

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10.1136/jim-2021-WRMC.289

Purpose of Study Heart transplant patients develop many opportunistic infections due to chronic immunosuppression. One of the more common complications is that of *Clostridium difficile* (CDif) causing gastroenteritis, usually represented as diffuse diarrhea. It appears that opportunistic infections such as CDif may have an impact on the immune system via the microbiome. It has not been demonstrated whether patients who develop CDif are at higher risk for the development of rejection or chronic rejection known as cardiac allograft vasculopathy (CAV) years after the event.

Methods Used Between 2010 and 2018, we assessed 69 heart transplant patients who developed CDif within the first year of post-transplantation. These patients were assessed for the development of subsequent 1-year survival, 1-year freedom from CAV (stenosis \geq 30% by angiography), 1-year freedom from non-fatal major adverse cardiac event (NF-MACE: MI, new CHF, PCI, ICD implant, stroke), and 1-year freedom from acute cellular rejection (ACR) and antibody-mediated rejection (AMR). These patients were compared to a control group who did not develop CDif.

Summary of Results The average time to infection following transplant was 2.2 ± 3.0 months. The heart transplant patients who developed CDif had significantly lower subsequent 1-year survival and lower 1-year freedom from AMR compared to the control group. There was no significant difference in the development of NF-MACE or CAV (see table 1). Assessment of specific immunosuppression, antibiotic prophylaxis, and specific CDif treatment did not have an impact on outcome.

Abstract 289 Table 1

| Endpoint | Donor \leq 39 Years (N=27) | Donor 40–49 Years (N=15) | Donor \geq 50 Years (N=8) | P-value |
|--------------------------------------|------------------------------|--------------------------|-----------------------------|---------|
| Recipient age (years, mean \pm SD) | 65.0 \pm 2.9 | 66.7 \pm 2.9 | 66.1 \pm 2.2 | 0.138 |
| 5-year Survival | 85.2% (23) | 93.3% (14) | 75.0% (6) | 0.431 |
| 5-year Freedom from CAV | 100.0% | 80.0% (12) | 100.0% | 0.039 |
| 5-year Freedom from NF-MACE | 93.6% (25) | 86.7% (13) | 75.0% (6) | 0.315 |
| 1-year Freedom from ACR | 92.6% (25) | 86.7% (13) | 100.0% | 0.549 |
| 1-year Freedom from AMR | 96.3% (26) | 93.3% (14) | 100.0% | 0.767 |

Abstract 290 Table 1

| Endpoints | HTx Patients w/CDif (N=69) | HTx Patients w/o CDif (N=69) | P-value |
|--|----------------------------|------------------------------|---------|
| Subsequent 1-year Survival | 84.1% | 97.1% | 0.010 |
| Subsequent 1-year Freedom from CAV | 98.6% | 95.7% | 0.341 |
| Subsequent 1-year Freedom from NF-MACE | 84.1% | 92.8% | 0.078 |
| 1-year Freedom from ACR | 94.2% | 97.1% | 0.366 |
| 1-year Freedom from AMR | 92.8% | 100.0% | 0.021 |

Conclusions Heart transplant patients who developed CDif appeared to have immune modulation that adversely affects outcome. Further investigation to study the microbiome is needed in order to elucidate the mechanisms that are in process.

COVID – health care research

Concurrent session

1:00 PM

Saturday, January 30, 2021

291 IMPLEMENTATION OF A COLLABORATIVE PEDIATRIC AND ADULT HYBRID TEAM IN THE CARE OF CRITICALLY ILL ADULT PATIENTS DURING CORONAVIRUS PANDEMIC: AN EXPERIENCE FROM A LARGE COMMUNITY HOSPITAL IN SAN JOAQUIN VALLEY, CALIFORNIA

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10.1136/jim-2021-WRMC.290

Purpose of Study The physician-to-resident ratio in California's San Joaquin Valley is well below the state average, a shortage aggravated by the increase in coronavirus disease 2019 (COVID-19) related hospital and medicine intensive care unit (MICU) admissions. To address the surge-induced strain on MICU treatment teams, pediatric intensivists and pediatric pharmacists at a large community hospital collaborated with physicians from the US Department of Defense Travis Air Force base to form a novel hybrid team to care for critically ill adult patients.

Methods Used Criteria for patient admission to the novel team were established. The hospital provided emergency privileges for pediatric intensivists to care for adult patients. Day-time coverage consisted of an adult intensivist, a pediatric intensivist, and a pediatric pharmacist. The adult intensivist acted as the primary attending on record. The night team consisted of either internal medicine or family practice physician and an on-call MICU team to oversee emergency procedures and codes. The pediatric team always worked with a physician trained in adult medicine.

Summary of Results The novel team consisted of 4 adult medicine physicians, 3 pediatric intensivists, and 4 pediatric pharmacists. The team operated for a total of 50 days. Of 256 MICU admissions during this timeframe, 40 (15.6%) were assigned to the novel team, with patients ranging from 24 - 93 years of age. 100 (39%) of the 256 total admissions were for critical COVID-19, of which 26 (26%) were assigned to the novel team.

Conclusions We demonstrated that implementing the unique model utilizing the combined expertise from professionals in various disciplines of pediatric and adult medicine during a pandemic is practical in providing care for a surge of critically ill adult patients and is also a potential solution to address staff shortages.

292 JOB-RELATED INJURIES OF HEALTHCARE WORKERS IN COVID-19: WHY SO FEW?

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10.1136/jim-2021-WRMC.291

Purpose of Study Lost workdays from illness or injury (I&I) were 5 times as many in April, 2020 as in April, 2019 (Gaffney A, JAMA Intern Med 7/27/20). These absences coincided with a peak in hospitalizations and deaths from COVID-19. Healthcare workers (HCW) shared in these absences (1.4% vs. 0.9% in non-HCW, $p < 0.001$). We found no evidence that such HCW absences were due to *work-related* I&I, and Gaffney 'had no data' on causes of the absences. We therefore compared the incidence of I&I from *work-related* causes in our medical center's HCW during 6-month intervals before COVID-19 (pre-Cov) vs. during its onset (In-Cov). We also compared restricted duty days (RDD) used to minimize actual absences from work due to I&I.

Methods Used We extracted data on causes and effects of I&I, and of resulting RDD, from medical records of all recorded work-related I&I events among 12,000 HCW at our 874-bed urban hospital during April-September, 2019 (pre-Cov) compared to I&I events during February-July, 2020 (In-Cov).

Summary of Results Pre-Cov I&I events exceeded In-Cov ones: 72 vs. 26, equal to 1.20 à 0.43 per 100 HCW per year, and compared to 1.01 expected per US Bureau of Labor Standards. Lifting patients led to 38% of Pre-Cov I&I, but only 16% of In-Cov ones ($p = 0.001$), resulting in muscle strains or sprains in 58% and 48% of HCW ($p = 0.20$), Pre-Cov and In-Cov, respectively. RDD were more numerous pre-Cov than In-Cov (30 ± 55 vs. 9 ± 13 , $p = 0.004$). Pre-Cov events led to more referrals for physical therapy or other expertise than In-Cov ones: 36% vs. 15%, $p < 0.05$). RDD were much higher in HCW referred for specialty care than in HCW without referrals, in both Pre-Cov and In-Cov groups: Pre-Cov, 71 ± 76 vs. 7 ± 8 , $p = 0.0003$; In-Cov, 37 ± 12 vs. 4 ± 5 , $p = 0.0001$. No HCW reported I&I from COVID-19.

Conclusions I&I events in our HCW were fewer in the first 6 months of COVID-19 and less likely to involve lifting patients, than in a prior 6-month interval. Reasons for these differences are unclear, but may reflect extra caution when moving patients or a difference in patient mix, with fewer needing such assistance. Under-reporting to avoid medical care for fear of contracting SARS-CoV-2 while seeking such care has been invoked to explain an increase in out-of-hospital cardiac deaths (Sayre M, MEDPAGE TODAY, 8/17/20).

293 THE EXPERIENCE OF COVID-19 BY U.S. DERMATOLOGY RESIDENTS: A NATIONAL SURVEY

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10.1136/jim-2021-WRMC.292

Purpose of Study To assess the impact of the COVID-19 pandemic on dermatology resident training and wellness.

Methods Used National survey of dermatology residents distributed by program directors and education coordinators of participating programs. Eligible participants were dermatology

residents enrolled in the U.S. residency programs during the COVID-19 pandemic. Resident wellness was measured using standardized screens (Maslach Burnout Inventory two-item survey, Patient Health Questionnaire 2, and the Generalized Anxiety Disorder 2-item screen). Changes in training were assessed through subjective reports.

Summary of Results One hundred sixty-nine of 597 (28%) dermatology residents responded to the survey; 6 responses did not meet inclusion criteria and were excluded from analysis. Fifty-nine of 163 (36%) residents reported exposure to COVID-19 positive patients, and of those exposed, 26 of 59 (44%) felt that they did not have adequate personal protective equipment (PPE). Most residents reported reduced clinical duties (127 of 162, 78%) and decreased time performing procedures (135 of 162, 83%). Most residents reported concern for a long-term negative impact to their procedural (111 of 161, 69%) and clinical skills (93 of 162, 57%), respectively. Nearly all residents (152 of 163, 93%) reported increased telemedicine use. Residents who reported increased telemedicine use had significantly higher odds of reporting concern for a long-term negative impact to procedural and clinical skills. Twenty-three percent of residents screened positive for burnout, 7% screened positive for depression, and 18% screened positive for generalized anxiety. Residents reporting job search concerns were more likely to be burnt out. Inadequate PPE availability and job search concerns were significantly associated with increased depression and burnout, respectively. No resident who reported adequate PPE had a positive depression screen.

Conclusions Dermatology residents are concerned about the impact on their clinical and procedural skills from the COVID-19 pandemic. Residencies can support resident wellness by ensuring adequate access to PPE and aiding residents in their job search.

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TELEMEDICINE USE BY ROUNDING HOSPITALISTS DURING COVID-19: A PILOT MODEL & QUALITATIVE STUDY

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10.1136/jim-2021-WRMC.293

Purpose of Study During the COVID-19 pandemic, our hospitalist group was short staffed without sufficient notice as some hospitalists tested to rule out COVID-19 infection. During this time, our hospitalists were able to perform work duties but quarantined at home for 2–4 days pending test results. Our hospitalist group explored the option of rounding on patients from home using telemedicine in a pilot study. We aimed to explore the suitability & feasibility of a telemedicine service for rounding & understand its limitations.

Methods Used Four rounding hospitalists performed 10 remote encounters (n=40) & 10 telepresenter encounters (n=40) each on admitted patients at Multicare Auburn Medical Center. Remote hospitalists situated themselves in our hospitalist office for the purposes of this pilot study. Each remote hospitalist was partnered with a ‘telepresenter’ who is also a hospitalist within our group. The telepresenter mobilizes the 2-way audiovisual cart into the patient room & performs a physical exam. Subsequently, we qualitatively interviewed all 4

rounding hospitalists individually & conducted content analysis of the interviews to evaluate & understand their experience.

Summary of Results Median duration per encounter was 10 minutes. Remote hospitalists were satisfied with their ability to evaluate & communicate with a patient using telemedicine. They felt confident knowing that the physical exam was performed by a hospitalist colleague, a ‘telepresenter.’ The 2-way audio-visual experience was seamless. As noted by our remote hospitalists, patients found the encounter to be positive & enjoyed continuity of care. There were no significant differences in how our physicians participated in discharge planning meetings, documentation, consultant discussions, & updating family as it pertains to telemedicine rounding. Limitations include the rapid response & late call workflow for which back-up systems will need to be implemented.

Conclusions Our hospitalists found telemedicine use to be feasible, rapidly deployable, & cost effective for patient rounding. We plan to create a 5-hour voluntary telepresenter moonlighting shift to support telemedicine rounding as needed.

295

RESPONSE RATE BEFORE AND DURING COVID-19 PANDEMIC FOR CHILDBIRTH EXPERIENCE SURVEY

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10.1136/jim-2021-WRMC.294

Purpose of Study The Childbirth Experience Survey (CBEX) is a multi-centered, two-part survey (antepartum and postpartum) evaluating pregnant women’s childbirth preferences and expectations. We are interested in analyzing the response rate to the surveys before and after Harbor-UCLA incorporated telehealth into prenatal care, whereby patients were physically seen less frequently in clinic and student researchers worked remotely.

Methods Used Between May 2019-February 2020, eligible patients were approached and consented by medical students or clinic staff during patients’ prenatal appointments. Starting July 2020, medical student researchers contacted previously consented patients by phone. If a patient did not answer, voicemail messages were left and the patient was contacted periodically.

Abstract 295 Table 1 Response rates before and during COVID-19 pandemic

| | May 2019-March 2020 (Pre-COVID) | July-August 2020 (During COVID) |
|---|---------------------------------|--|
| Contacted | 220 | 155 |
| Answered | 220 (100%) | 24 (15.5%) |
| Completed either/both survey(s) | 143 (65.0%) | 16 (10.3% of contacted patients, 66.7% of patients who answered) |
| Agreed to participate but did not complete either/both survey (s) | 46 (20.9%) | 0 (0%) |
| Declined participation | 31 (14.1%) | 8 (5.2% of contacted patients, 33.3% of patients who answered) |

Summary of Results 220 women were approached between May 2019-March 2020, of which 189 (85.9%) agreed to participate. Of these, 128 (67.7%) completed the antepartum survey, 6 (3.1%) completed the postpartum survey, 9 (4.7%) completed both surveys, and 46 (24.3%) did not complete either survey. Between July-August 2020, 155 women were contacted, of which 24 answered the phone. Of these, 16 (66.7%) completed either survey and 8 (33.3%) declined participation. Voicemail messages were left on 131 women's phones.

Conclusions There is a significant barrier to contacting patients for research via phone, however, once contact is made, the rates of participation are comparable between in person and virtual. This shows the quality with which medical students are able to speak with patients regardless of mode of communication but may warrant further exploration into more effective virtual communication methods.

296 COVID-19 IMPACTS ON PEDIATRIC ORTHOPEDIC SURGERY

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10.1136/jim-2021-WRMC.295

Purpose of Study The COVID-19 pandemic required rapid, global healthcare shifts to prioritize urgent or pandemic-related care and minimize transmission. Little is known about impacts on pediatric orthopedic surgeons during this time. We aimed to investigate COVID-19 related changes in practice, training, and research among pediatric orthopedic surgeons globally.

Methods Used An online, cross-sectional survey was administered to orthopedic surgeons with interest in pediatrics in April 2020. The survey captured demographics and self-reported experiences during the pandemic. Surgeons were recruited through web media and email lists of orthopaedic societies over 2 months. Descriptive statistics were used to analyze results.

Summary of Results We received 460 responses from 45 countries. 358 (78.5%) respondents reported lockdown measures in their region at time of survey. Most (n=337, 94.4%) reported pausing all elective procedures. Surgeons reported reduction in average number of surgeries per week, from 6.89 (SD=4.61) pre-pandemic to 1.25 (SD=2.26) at time of survey (mean difference=5.64; 95% CI=5.19, 6.10). Average number of elective outpatient appointments per week decreased from 67.89 (SD=45.78) pre-pandemic to 11.79 (SD=15.83) at time of survey (mean difference=56.10, 95% CI: 5.61, 60.58). 177 (39.4%) surgeons reported using virtual modes of outpatient appointments for the first time. Of 290 surgeons with trainees, 223 (84.5%) reported systems to continue training. Of 192 surgeons with research, 149 (82.8%) reported continuing research activities during pandemic. Most reported cessation (n=75, 64.1%) or reduction (n=40, 34.1%) in patient recruitment at time of survey.

Conclusions We found significant impacts on pediatric orthopaedic practice with uptake of technology to provide care continuity. Understanding global impacts can inform sustainable practices to provide continuity in future disruptions. We will pursue follow-up surveys to assess longitudinal impacts on surgeons. Epidemiological studies are needed to assess impacts of delayed and virtual care on patient outcomes.

297 DETERMINANTS OF COVID-19 VACCINE ACCEPTANCE AMONG HEALTH CARE PROVIDERS AND CITIZENS IN NEVADA

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10.1136/jim-2021-WRMC.296

Purpose of Study With the upcoming release of a COVID-19 vaccine, public health officials and policymakers need to create strategic vaccine-acceptance messaging to effectively control the pandemic and prevent additional deaths. Health care providers often make vaccine recommendations to their patients, so it is also important to understand their knowledge and attitudes in order to develop continuing medical education accordingly. The intent of this study is to assess general public and health care provider attitudes towards the COVID-19 vaccine.

Methods Used Three anonymous, online, repeated cross-sectional surveys will be utilized to survey Nevada public citizens and health care providers and trainees. Two surveys will be used with the general public, one based on the Health Belief Model and another based on a Motivated Reasoning Model. A third survey will assess attitudes of healthcare workers and trainees.

Summary of Results The primary research question we are posing to both the general public and health care providers is their intention to receive the COVID-19 vaccine. We will also report the relation between attitudes towards COVID-19 vaccination and previous history of influenza vaccination. The results of this study are currently in progress, and we expect to have data to report in the next several weeks. To our knowledge, this will be novel data, as the development and release of a vaccine progresses. Our preliminary data will record the attitudes before the COVID-19 vaccine official release. We will continue to distribute the survey monthly to assess how attitudes change over time.

Conclusions Approaching the release of a COVID-19 vaccine, it is important to ascertain knowledge regarding attitudes surrounding the vaccine from both the general public and health care providers. The results of this study will provide guidance to officials in creating appropriate and effective communication and education for vaccine promotion and acceptance.

298 ASSESSING BARRIERS AMONG HIV, SUBSTANCE USE DISORDER, AND TRANS PATIENTS DURING THE COVID-19 PANDEMIC

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Purpose of Study COVID-19's effects on the health of vulnerable populations are still emerging; however, current data suggest a disproportionate burden of illness and death among groups with substance use disorders (SUD), HIV/AIDS, and the transgender community. The widening of healthcare disparities during COVID-19 justifies the exploration of implicit

and explicit barriers faced by vulnerable populations when accessing healthcare. Our objective was to explore socioeconomic barriers by surveying healthcare providers at Fenway Health about the impacts of COVID-19 on their patient's healthcare access and to investigate ways to mitigate barriers that may be widening the health disparities for vulnerable patients.

Methods Used 74 providers completed a cross-sectional survey administered via email in July 2020 at Fenway Health, a large multi-site community health center. Fisher's exact tests were used to compare outcomes with respect to the COVID-19 time periods.

Summary of Results The frequency of outcomes reported are associated with whether providers were asked about *before* versus *during* COVID-19. Providers reported that, during COVID-19, mental health concerns for patients were higher ($p < 0.001$) and more patients were lacking access to transportation ($p < 0.001$). Most providers (88%) reported that their patients were not informed of the resources available to them through the CARES Act, where providers identified financial barriers (66%) to be the most common and language barriers (22%) to be the least common.

Conclusions Evidence suggests that improvements can be made to better facilitate efficient transportation, provide mental health services, and make appointments more convenient for these patients. Most providers identified a lack of education and understanding of the CARES Act among their patients to access available resources. This indicates a need for providing an outreach and education department to ensure that patients are aware of their options and resources. Financial barriers were the most common, which may require institutional and governmental resources to curb this disparity. Language barriers were least commonly reported.

Endocrinology and metabolism II

Concurrent session

1:00 PM

Saturday, January 30, 2021

299

AN INVESTIGATION OF DIET QUALITY AND HYPOTHALAMIC GLIOSIS IN CHILDHOOD OBESITY

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10.1136/jim-2021-WRMC.298

Purpose of Study Recent research suggests a neurobiological basis of obesity specifically related to the mediobasal hypothalamus (MBH), a critical brain area for energy homeostasis and appetite. Hypothalamic gliosis, a cellular inflammatory response, is shown as a key component for diet-induced obesity in rodents. Additionally, evidence reveals that high-fat diets can cause MBH gliosis in rodent models. This project investigates the relationship between diet quality and MBH gliosis in children, the latter assessed by magnetic resonance imaging (MRI).

Methods Used Participants were part of the NIH ABCD study. At baseline, anthropometric data was collected along with brain T2-weighted MRI signal intensities from the MBH,

amygdala, and putamen. MBH gliosis was measured using a mean bilateral MBH/Amygdala T2 signal ratio; Putamen/Amygdala was a control ratio. At the 1y follow-up, the child's habitual diet was assessed by a parent-report food frequency questionnaire. Linear regressions assessed the relationship between diet quality, body adiposity, and MBH gliosis, all adjusted for age, study site, and sex.

Summary of Results A subsample of 192 participants were included. At baseline, 49% were males, mean age and BMI z-score were $9.9 \pm 0.6y$ and 0.76 ± 1.05 , 19% were overweight and 23% with obesity. Individuals with an increased BMI z-score were associated with greater evidence of MBH gliosis ($\beta = 0.017$, $P = 0.038$, $n = 183$), but this relationship was not present in the control ratio ($\beta = 0.002$, $P = 0.503$, $n = 183$). There was no significant association between individuals with an unhealthy diet and an increased BMI z-score ($\beta = -0.008$, $P = 0.861$, $n = 123$), or greater evidence of MBH gliosis ($\beta = 0.4$, $P = 0.344$, $n = 116$).

Conclusions Parent-reported diet quality over one year was not associated with a radiologic measure of MBH gliosis, although increased body adiposity was. Thus, the findings emphasize a potential neurobiological contributor of childhood obesity, but further studies with more precise diet exposure assessments are needed to uncover any dietary determinants. These insights may advance the understanding of obesity pathogenesis and further inform novel treatments to combat the escalation of childhood obesity.

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DISSOCIATION OF IN VIVO AND EX VIVO MITOCHONDRIAL FUNCTION IN TYPE 2 DIABETES

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10.1136/jim-2021-WRMC.299

Purpose of Study People with type 2 diabetes (T2D) develop excess cardiovascular disease and decreased cardiorespiratory fitness, a predictor of premature mortality. T2D includes impaired insulin sensitivity, vasodilation, and mitochondrial function. These cardiac and systemic abnormalities may contribute to impaired cardiovascular exercise capacity (CVEC), though the T2D specific mechanisms are unknown. Mitochondrial dysfunction may play a significant role.

Methods Used To characterize mitochondrial dysfunction in T2D, we evaluated mitochondrial function obtained both *in vivo* by ^{31}P phosphorous magnetic resonance spectroscopy (^{31}P -MRS), and *ex vivo* via mitochondrial oxygen consumption with lipids or carbohydrates under different conditions in biopsied muscle fibers using the Oroboros Oxygraph-2k (O2K). These measurements were acquired in sedentary adults with and without T2D. We hypothesized that *in vivo* and *ex vivo* mitochondrial function measurements would correlate.

Summary of Results Data from 47 controls (age 48 ± 12 years, BMI 30.7 ± 5.2 kg/m²) and 39 participants with T2D (age 53 ± 11 years, BMI 32.4 ± 4.7 kg/m²) were included. In control participants, there was a significant correlation ($R \geq 0.35$) between ^{31}P -MRS measured phosphocreatine synthesis (VPCr), a measure of the ability to generate high energy phosphate *in vivo*, and multiple mitochondrial respiration endpoints in muscle ($p < 0.05$), whereas this relationship was not present in participants with T2D (table 1).

Abstract 300 Table 1

| Ex vivo O2K Respiration vs. in vivo VPCr | Control | | T2D | |
|---|---------|---------|---------|---------|
| | R value | P value | R value | P value |
| Lipid state 2 (leak, no ADP) | 0.388 | 0.015 | 0.019 | 0.921 |
| Lipid state 4 (leak, ATP synthase inhibition) | 0.371 | 0.020 | -0.157 | 0.417 |
| Lipid max uncoupled | 0.433 | 0.006 | -0.080 | 0.679 |
| Carb state 4 (leak, ATP synthase inhibition) | 0.350 | 0.027 | -0.055 | 0.771 |

Conclusions These data suggest a dissociation between skeletal muscle fiber mitochondrial oxidative capacity and *in vivo* oxidative flux with exercise perturbation in adults with T2D. Skeletal muscle factors in T2D, such as blood flow and substrate flux limitations, may contribute to the CVEC defect. Experiments testing the impact of exercise training on this dissociation in T2D are ongoing.

301 AMPK STIMULATES INSULIN CLEARANCE IN HEPATOCYTES

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10.1136/jim-2021-WRMC.300

Purpose of Study Plasma insulin levels are controlled by its production and clearance. Before newly secreted insulin enters the peripheral blood system, 50–80% of it is degraded in the liver. Hepatic insulin clearance is a regulated process and its decrease in insulin resistant states is a major contributor to hyperinsulinemic compensation and the protection against type 2 diabetes (T2D). However, the molecular mechanisms and factors involved in the regulation of hepatic insulin clearance are poorly understood. Using a systems biology approach involving hepatic transcriptome and pathway analyses, our laboratory has previously identified the AMPK signaling pathway to be significantly correlated with insulin clearance across >100 inbred mouse strains. The purpose of this study is to investigate the role of AMPK in hepatic insulin clearance.

Methods Used Primary mouse hepatocytes were used in an *in vitro* assay of insulin clearance from the culture medium. Cells were incubated with activators (AICAR, phenformin) and an inhibitor (Compound C) of AMPK and insulin concentrations in the media were measured by ELISA. To assess the impact of insulin receptor (INSR) downregulation on insulin clearance, we performed similar experiments after 48 hours of pre-incubation in the presence of supraphysiological insulin concentrations.

Summary of Results AICAR and phenformin increased the rate of insulin clearance whereas Compound C suppressed the effect of AICAR. While pretreatment with high insulin concentrations reduced insulin clearance, the stimulatory effect of AMPK activators remained undiminished.

Conclusions In this study, we identified AMPK as a novel determinant of insulin clearance in hepatocytes, consistent with a previous report of AICAR-stimulated internalization of the INSR. Our results also suggest that AMPK activation may increase the rate of INSR recycling back to the cell surface. In conclusion, our study raises the possibility that the modulation of insulin clearance via AMPK may offer a novel therapeutic approach in the prevention or treatment of T2D.

302 EFFECT OF ONE MONTH EXPOSURE TO COMPONENTS OF THE REPROMETABOLIC SYNDROME ON PHYSICAL ACTIVITY AND BODY COMPOSITION IN WOMEN

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10.1136/jim-2021-WRMC.301

Purpose of Study Subfertility in obese women is associated with chronic pituitary suppression and reduced sex steroid production, which, in turn, is due to reduced pituitary sensitivity to GnRH. We have found evidence for a combined effect of hyperinsulinemia and high circulating free fatty acids in acutely suppressing pituitary gonadotropin secretion over 4 hours and are in process of examining the ability of a one-month exposure to a eucaloric high-fat diet (HFD) to suppress gonadotropins in lean women. The aim of this study is to examine the effect of the one-month HFD on physical activity and body composition.

Methods Used 12 normal weight (BMI < 25 kg/m²), normally cycling female participants of reproductive age were given a one-month eucaloric HFD with app 50% calories from fat beginning from the onset of menses in one cycle through the next. DEXA body composition was measured before and after the diet intervention. A Fitbit was provided to monitor changes in daily activity and sleep throughout the study. Measurement of gonadotropin pulsatility and reproductive hormones were done using frequent blood sampling and daily urine excretion, respectively. These measurements were obtained for a total of 4 menstrual cycles: 1 pre-diet cycle, the HFD cycle, and 2 post-diet cycles.

Summary of Results Fitbit data over the course of 4 cycles showed fluctuations in the number of daily steps (7,233.68 ± 159.49) and calories burned (1,895.94 ± 12.43). Averages in the HFD cycle were similar to the pre-diet cycle, however, suggesting that participants-maintained activity levels through the HFD intervention. Variations in sleeping minutes (428.37 ± 5.01) and wakefulness after sleep onset (1.42 ± 0.07) were minimal, suggesting no apparent difference in sleep quality in relation to the HFD. Surprisingly, DEXA results suggest a decrease in extremity and trunk body fat, despite no change in BMI with an average difference of 0.096 ± 0.517. These data were not expected, and further analysis is in progress.

Conclusions The complete cohort has not yet been fully recruited and analyzed. Preliminary findings indicate that a one-month, HFD does not cause physical activity or sleep disruption, although subtle alterations in body composition may be present.

303 VERTICAL SLEEVE GASTRECTOMY IMPROVES INSULIN SENSITIVITY IN SEVERELY OBESE TEENAGERS

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10.1136/jim-2021-WRMC.302

Purpose of Study Bariatric surgery is increasingly utilized for the treatment of severe obesity in adolescents and appears to improve dysglycemia in those with pre-existing type 2 diabetes (T2D). However, the early effect of surgery on insulin

sensitivity and secretion during improved glycemic control in those with T2D is unclear.

Methods Used In this pilot study, we assessed diabetes control, insulin sensitivity and secretion in youth with T2D before and 3 months after vertical sleeve gastrectomy (VSG). A mixed meal tolerance test (MMTT, a liquid meal consisting of 45 g carbohydrates, 14 g fat, and 14 g protein) was ingested and blood glucose and insulin concentrations were frequently sampled over 4 hours. Physical characteristics, fasting measures and HbA1c were also collected. Calculations include Matsuda index, HOMA-IR, HOMA-%B, and disposition index (DI) and were calculated as indices of insulin sensitivity and secretion, respectively.

Summary of Results Five youth (age 16.6 ± 1.8 , BMI 44.4 ± 2.6 , 60% male) were studied. Three months after VSG, average weight loss was 21.5 ± 4.7 kg resulting in a significant $16.2 \pm 10.7\%$ ($p < 0.005$) reduction in BMI. HbA1c significantly decreased from $6.5 \pm 0.7\%$ to $5.5 \pm 0.3\%$ ($p = 0.021$) and normalized ($< 5.7\%$) in 80% of participants. Prior to surgery all participants were taking diabetes medications (1–3 medications) and at 3 months none required medications. The Matsuda Index (pre 2.2 ± 0.8 vs post 3.0 ± 0.7) and HOMA-IR (5.7 ± 2.7 vs 2.4 ± 0.6) significantly improved ($p < 0.05$) whereas HOMA-%B (76.7 ± 49.2 vs 39.9 ± 21.0 , $p = 0.056$) and DI (6.0 ± 4.4 vs 8.0 ± 3.7 , $p = 0.17$) were not statistically significant.

Conclusions Within 3 months, VSG induces notable weight loss and improvements in diabetes control in youth with obesity and T2D. These changes are accompanied by improved insulin sensitivity and non-significant improvements in secretion. Future studies with more participants will investigate whether this short-term improvement is durable over years and investigate potential mechanisms underlying this metabolic improvement.

304 CORTISOL AND VITAMIN D LEVELS AS RELATED TO STRESS IN FIRST AND SECOND YEAR MEDICAL STUDENTS

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10.1136/jim-2021-WRMC.303

Purpose of Study Stress among medical students affects academic performance and can lead to depression, substance use, and suicide. It has been found that 35.8% of students experienced mild to moderate levels of stress during their four years of medical school¹. However, there are no studies involving medical students that have considered an objective marker for measuring stress and what physiological factors may contribute to high levels. In order to assess the impact of stress on medical students, this project compared cortisol levels, vitamin D levels, and Perceived Stress Scale (PSS) scores between the beginning and end of an academic semester.

Methods Used Medical students ($n=50$) received 8 am blood draws for Vitamin D and Cortisol and completed the PSS survey. This was performed at the beginning and the end of the Fall 2019 semester. The three variables were treated as continuous variables in all statistical tests. We assessed these variables

for normality using histograms and Shapiro-wilk tests and used Pearson R Correlations for associations between continuous variables.

Summary of Results The mean cortisol levels significantly increased from 14.1 ± 0.6 $\mu\text{g/dL}$ (SE) at the first time point to 16.9 ± 0.5 $\mu\text{g/dL}$ (SE) at the second time point ($t = -3.44$, $df = 71.5$, $p < 0.001$).

The mean vitamin D levels significantly decreased from 28.5 ± 1.2 ng/mL (SE) at the first time point to 20.7 ± 1.2 ng/mL (SE) at the second time point ($t = 4.68$, $df = 88.5$, $p < 0.001$).

The mean PSS level significantly increased from 13.3 ± 1.0 at the first time point to 17.9 ± 0.9 at the second time point ($t = -3.30$, $df = 95.6$, $p < 0.001$).

Conclusions Our results show that at the end of the fall semester, the average student will see a statistically significant decrease in vitamin D, increase in cortisol, and increase in stress. These results suggest a need for vitamin supplementation per the Endocrine Society clinical practice guideline² and continued education in a well rounded lifestyle throughout preclinical years. Limitations of our study include a small sample size and the possibility of inaccurate cortisol levels due to fluctuations throughout the day.

305

SOCIAL MEDIA PERSPECTIVES AND QUESTIONS OF LIVING WITH POLYCYSTIC OVARIAN SYNDROME

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10.1136/jim-2021-WRMC.304

Purpose of Study Polycystic ovarian syndrome (PCOS) affects 15% of reproductive age women with varying manifestations: primarily anovulation and infertility. Research finds higher rates of depression and anxiety among women with PCOS. Social media sites are used by women to learn more about their condition. This study sought to determine what questions women had and the medical accuracy of the advice they were given.

Methods Used A team of investigators searched for the most viewed social media posts using the keyword 'PCOS' between July and December 2019. The criteria for popular posts varied by site: posts in public Facebook PCOS groups, Reddit r/PCOS with ≥ 175 upvotes, YouTube videos with ≥ 1000 views, Instagram photos with ≥ 5 likes and Tweets with ≥ 1 interaction were analyzed for mentions of advice, conflicts of interest, and any of the following themes: weight loss, experience with doctors, medication, fertility, acne, abnormal hair growth, anxiety, depression, mental health and/or menstrual irregularity. Advice was classified into categories of 'completely accurate' if it was supported by a medical association, 'insufficient evidence' if it only was found in peer-reviewed studies, and 'inaccurate' if any part was against clinical guidelines or was unsupported. Conflict of interest was noted when it mentioned products from which the poster gained profits.

Summary of Results 376 posts were analyzed with 704 total mentions of the selected themes. Fertility ($n=106$), weight loss ($n=101$), and medication ($n=100$) were the most frequently

mentioned, while anxiety (n=28) and depression (n=35) were the least. 100% of Instagram posts contained conflicts of interest (n=47) and 98 were recorded overall.

182 total pieces of advice were recorded: Facebook (54%) and Reddit (49%) had the highest accuracy, while Instagram (n= 23, 58%) had the highest inaccuracy.

Conclusions Physicians can create stronger supportive relationships with patients with PCOS by educating more on the themes women most frequently discuss online, such as fertility and weight loss, any by screening for anxiety and depression, as women seem to be largely unaware of those risks.

306 A PRACTICAL AND ACCURATE METHOD TO QUANTIFY PANCREATIC FAT ON MRI IN CHILDREN WITH NONALCOHOLIC FATTY LIVER DISEASE

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10.1136/jim-2021-WRMC.305

Purpose of Study Pancreatic fat is associated with nonalcoholic fatty liver disease (NAFLD). Fully segmenting the pancreas on MRI for fat measurement is difficult and time-consuming. Small regions of interest (ROIs) are a proxy for full segmentation, but they may lead to errors due to pancreatic fat heterogeneity. We aimed to develop a new partial segmentation method that traces the pancreas in representative, easily-identified slices. Free-breathing MRI was used to quantify pancreatic proton-density fat fraction (pPDFF, 0–100%), compare partial segmentation to standard methods, and to correlate pPDFF with markers of metabolic dysfunction.

Methods Used This prospective study enrolled children with and without NAFLD. pPDFF measurements from partial segmentation were compared to full segmentation and 3-ROI methods. Data from partial segmentation were correlated with markers of metabolic dysfunction.

Summary of Results 17 children with NAFLD (14.5 ± 2.3 years) and 19 healthy children (12.3 ± 2.7 years) completed the study. Mean pPDFF measurements from partial and full segmentation did not differ significantly (6.5 ± 3.3% vs 6.7 ± 3.7%; $p > 0.99$), but the number of slices was less with partial vs. full segmentation (3 vs. 10.7 ± 2.5 slices). Both had a greater pPDFF compared to the 3-ROI method (6.5 ± 3.3% vs 5.6 ± 4.6%, $p = 0.002$ for partial vs. 3-ROI, 6.7 ± 3.7% vs 5.6 ± 4.6%, $p < 0.001$ for full vs. 3-ROI). NAFLD subjects had a greater pPDFF vs. controls (8.9 ± 3.2% vs. 4.3 ± 1.2%, $p < 0.001$). Pancreatic PDFF correlated with body mass index ($r = 0.6$, $p < 0.001$), waist circumference ($r = 0.6$, $p < 0.001$), liver PDFF ($r = 0.7$, $p < 0.001$), and hemoglobin A1c ($r = 0.5$, $p = 0.04$). pPDFF did not correlate with serum alanine aminotransferase ($r = 0.05$, $p = 0.8$).

Conclusions The partial segmentation method using free-breathing MRI accurately quantifies pancreatic fat and is simpler to obtain than full segmentation. In this cohort, we observed a relationship between pancreatic fat and metabolic dysfunction.

Surgery IV

Concurrent session

1:00 PM

Saturday, January 30, 2021

307 INCIDENCE, RISK FACTORS, AND HEALTHCARE RESOURCE UTILIZATION OF EARLY ACUTE KIDNEY INJURY FOLLOWING LUNG TRANSPLANT

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10.1136/jim-2021-WRMC.306

Purpose of Study Acute kidney injury (AKI) following lung transplant has been found to lead to poorer outcomes and higher healthcare resource utilization. We sought to evaluate the incidence of AKI in our lung transplant population two weeks post-operatively and associate the severity of AKI with known perioperative risk factors.

Methods Used This was a retrospective review of all patients 18 years of age or older who received lung transplants at the University of Washington between January 1 and August 31, 2019. Serum creatinine values were collected two weeks post-operatively and staged according to the 2012 Kidney Disease Improving Global Outcomes (KDIGO) criteria. Outcomes were the development of mild AKI (Stage 1) versus more severe AKI (Stage 2 and 3). Perioperative risk factors were analyzed utilizing the Wilcoxon rank-sum test for continuous metric variables and the Fisher's exact test for categorical variables.

Summary of Results Of the 31 patients assessed, 27 (87%) developed AKI, with 11 (35%) Stage 1 and 16 (52%) Stage 2 and 3. 1 out of the 27 patients who developed AKI (4%) required renal replacement therapy during their post-transplant hospital course. Significantly lower preoperative and intraoperative hematocrit ($P=0.0016$ and $P=0.0168$ respectively) and significantly higher graft ischemic times ($P=0.0057$ for the first lung and $P=0.0076$ for the second lung) were found in those with more severe AKI. Mechanical ventilation time ($P=0.6919$), ICU stay ($P=0.7887$) and hospital stay durations ($P=0.9082$) were not found to be significantly different between the mild and more severe AKI groups.

Conclusions Post-operative AKI was a common complication in our population. Patients with more severe pre- and intraoperative anemia and those with longer graft ischemic times were more likely to develop Stage 2 and 3 AKI. In contrast to previous findings, the severity of AKI was not associated with longer ICU and hospital stays or longer ventilation times.

308 IDENTIFYING LOWER EXTREMITY ASYMMETRIES IN PREVIOUSLY INJURED RECREATIONAL ENDURANCE RUNNERS

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10.1136/jim-2021-WRMC.307

Purpose of Study Endurance running has grown in popularity as a method of maintaining fitness and goal setting in recent years. It is common for recreational endurance runners to develop lower extremity (LE) pain and/or injury at some point during their training related to overuse. We examined the effects self-reported prior LE injury had on a runner's functional movement, strength, and body composition. Identification of functional or structural asymmetries may better inform preventative training strategies for runners.

Methods Used This study included both healthy runners and those that had previously been injured but were currently running pain free. Runners completed a series of tests: a Dual-Energy X-Ray Absorptiometry (DEXA) scan to assess body composition and bone density; a Functional Movement Screen (FMS) to identify functional movement deficiencies (skills included hurdle step, inline lunge, and active straight leg raise); a Lower Quartile Y-Balance Test (YBT) to measure dynamic balance (anterior, posteromedial, posteriolateral, and composite); and Isokinetic fatigue strength protocol (35 reps for each limb, knee flexion/extension, hip abduction/adduction, and hip flexion/extension). Currently, the differences are identified visually and will be statistically assessed shortly. The statistical model will compare affected limb to non-affected limb using independent t-tests.

Summary of Results Previously injured runners presented with bilateral asymmetry in their scores for FMS. The greatest asymmetry found was in the hurdle step and inline lunge skills. There was no significant LE asymmetry found in body composition, bone mineral density, or YBT. Data analysis of the isokinetic strength test and fatigue ratios is ongoing.

Conclusions The asymmetries found in the inline lunge and the hurdle step indicate a sagittal plane imbalance that is similar to the running pattern. The lack of bone density differences in this population are not surprising, as none of the self-reported injuries were stress fractures or non-soft tissue injuries. We hypothesize that when the statistics are run, we might see differences in YBT and fatigue strength testing bilaterally.

309

HIP SURVEILLANCE FOR CHILDREN WITH CEREBRAL PALSY: A SURVEY OF ORTHOPAEDIC SURGEONS IN INDIA

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10.1136/jim-2021-WRMC.308

Purpose of Study This cross-sectional survey aimed to assess current practice and beliefs of pediatric orthopaedic surgeons practicing in India regarding hip surveillance in children with CP. We wished to establish whether there is support for hip surveillance and identify potential challenges and solutions for implementing guidelines specific to the Indian healthcare system.

Methods Used An anonymous online survey was distributed to approximately 350 Paediatric Orthopaedic Society of India (POSI) members. The survey included demographic questions and questions pertaining to surgeons' current practice and beliefs about hip surveillance for children with CP.

Summary of Results In total, 107 orthopaedic surgeons practicing in India responded. Surgeons reported an average

75% of their caseload as pediatric with 26% of pediatric caseloads being children with CP. There was strong consensus regarding the importance of hip surveillance for children with CP, as 96.2% (100/104) of respondents agreed that hip displacement requires standardized monitoring and 96.2% (100/104) agreed that hip dislocation should be prevented by hip surveillance and surgery. Almost all (97%) surgeons indicated a need for hip surveillance guidelines in India, with 100% expressing interest in following Indian-specific guidelines. The most commonly anticipated challenges included late referrals to orthopaedics (81.2%), loss of patients to follow-up (78.2%), and lack of resources (43.6%). Requirements for successful implementation included developing Indian-specific guidelines (83.2%) and education for surgeons (56.4%), physiotherapists/pediatricians (90.1%), and families (82.2%).

Conclusions Pediatric orthopaedic surgeons in India support the prevention of hip dislocations in children with CP through hip surveillance and surgical intervention. Almost all surgeons indicated a need and interest in implementing Indian guidelines. Education of families and the child's healthcare team, including orthopaedic surgeons, were seen as requirements for successful implementation.

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AN INSIDIOUS PROGRESSION OF *MORGANELLA MORGANII* IN ASCENDING CELLULITIS

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Introduction Cellulitis is a relatively common condition. While for some, a short hospital stay managed with the appropriate antibiotics is sufficient, this condition can have fatal consequences. Our case reports on the challenges of ascending cellulitis from unexpected, opportunistic microorganisms that risk progression into necrotizing fasciitis.

Case Presentation A 33-year-old female with stage three lipedema presented to the local emergency department with a small region of cellulitis located to the right medial thigh. After evaluation, she was discharged with clindamycin but returned two days later with worsening spread of infection and was subsequently admitted. During her hospital course it was discovered a month prior, she had received liposuction treatments for weight management and that she had sustained full thickness laceration of the right heel. After 6 days with cellulitis unresponsive to antibiotics, she developed symptoms up into the right groin and lower abdominal wall. An ultrasound discovered a large abscess coalescing in the right medial thigh, requiring intubation in the operating room for emergent incision and drainage. Cultures taken during surgery *Morganella morganii* with exquisite sensitivity to ciprofloxacin. She recovered and was discharged in 2 days with cellulitis resolved and resolution of symptoms. The care team hypothesizes that *M. morganii* entered through the patient's heel with rapid ascent resulting in sepsis and abscess formation.

Conclusion Our case highlights the need to recognize atypical presentations of cellulitis will prompt attention and intervention from health care providers. These patients can present with unimpressive symptoms but are at great medical risk as cellulitis could have rapidly developed into a life-threatening

infection. The patient's history of later stage lipedema, complicated by a recent history of liposuction, makes her more susceptible to cellulitis with great proclivity and virulence, advocating for an additional level of suspicion when patients affected by this disease respond poorly to antibiotics. Physicians should be aware of the great risks associated with ascending cellulitis, aim to prevent complications and deterioration, and be equipped to educate and closely monitor these patients.

311 PEDIATRIC HAND FRACTURES: HOW OFTEN DO WE OPERATE?

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Purpose of Study Pediatric hand fractures are common and make up one of the most frequent fracture presentations to the emergency department. Fractures in this population tend to heal well and hand fractures are no exception. Management of hand fractures in this population involves immobilization, closed reduction, and rarely, surgical intervention. There is a paucity of literature examining the outcomes of pediatric hand fractures.

Methods Used Records of patients under 18 years old who presented to the British Columbia Children's Hospital Emergency Department between 01-NOV-2016 to 31-JAN-2020 with metacarpal or phalangeal fractures were analyzed. Demographics, mechanism of injury, radiograph results, fracture specifics, and treatment for each hand fracture were collected. Individuals with isolated carpal fractures and incomplete records were excluded.

Summary of Results A total of 501 patients with 524 recorded hand fractures were identified. There were 313 (59.7%) nonepiphyseal fractures and 211 (40.2%) epiphyseal fractures, of which 185 (87.7%) were Salter-Harris II. Of the 134 fractures (25.6%) that required closed reduction; 70% of these were reduced in the ED. Only 12 fractures (2.2%) required surgery. Of the operative cases, 10 were closed reduction with k-wire fixation, 1 open reduction with k-wire fixation and 1 closed reduction with no fixation (1.7%, 0.2% and 0.2% of all fractures respectively). Of the 12 fractures requiring surgery, 7 (58%) involved the proximal phalanx. Children ages 8 and older made up 77% of operative candidates with an average of 3 clinical visits (range 2–5). Nonoperative candidates had on average 1.8 clinical visits (range 1–5). There was 0% reoperation rate, no documented infection, and 1 (0.2%) unsatisfactory reduction that did not require further intervention.

Conclusions Pediatric hand fractures make up a large proportion of ED visits annually. The majority of fractures do not require surgery and are well managed with closed reduction in the ED or immobilization alone. Complications and reoperation are rare. Nonoperative treatment offers very encouraging outcomes likely resulting from bony remodeling in the developing hand which can ultimately correct subtle differences in anatomical alignment.

312 INTRA-OPERATIVE MEAN ARTERIAL BLOOD PRESSURE PREDICTS NEUROLOGIC RECOVERY FOLLOWING ACUTE TRAUMATIC SPINAL CORD INJURY

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10.1136/jim-2021-WRMC.311

Purpose of Study Current guidelines recommend maintaining mean arterial blood pressure (MAP) above 85–90 mmHg following spinal cord injury (SCI). A paucity of data exists to support these guidelines in the perioperative period. This study assessed if intra-operative MAP correlates with American Spinal Injury Association (ASIA) motor score recovery at hospital and rehabilitation discharge following acute traumatic SCI.

Methods Used We conducted a retrospective analysis of acute traumatic SCI patients surgically treated from 2017–2019 at a single high-volume level I trauma center. Exclusion criteria included: >48 hours from injury to surgery, age <16 years, incomplete motor exams, and incomplete MAP data. MAP measurements were obtained on a minute by minute basis via invasive arterial line measurement during surgery. Intra-operative MAP exposure was characterized using an area-under-the-curve approach. The total bounded area below 85 mmHg was calculated over the entire surgical period, then divided by surgery duration to achieve a normalized 'average depth' MAP value. Single variable linear regression was used to examine the relationship of intra-operative MAP with the change in motor score at two time points.

Summary of Results After inclusion criteria were met, n=123 and n=88 patients were identified at hospital discharge and rehab discharge, respectively. Average duration of surgery was 5.26 hours (SD 1.74). No statistically significant association was found between intra-operative MAP and change in motor score at the earlier time point: hospital discharge. However, an increase of 1 mmHg in intra-operative MAP average depth corresponded to a motor score increase of 0.94 points (p=.022; 95% CI = 0.14, 1.74) by the second time point: rehab discharge.

Conclusions Intra-operative MAP correlates with neurologic recovery following SCI at rehab discharge but not hospital discharge. Particularly, patients with lower intra-operative MAP values (<85 mmHg), had a smaller overall improvement in ASIA motor score following SCI.

313 SURGEON RECOMMENDATIONS FOR PHYSICAL ACTIVITY IN PATIENTS WITH PEDIATRIC HIP DISORDERS

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10.1136/jim-2021-WRMC.312

Purpose of Study This study aimed to assess opinions and consensus among orthopaedic surgeons when recommending physical activity (PA) to school-aged pediatric hip patients.

Methods Used Orthopaedic surgeons were invited from member lists of 4 large pediatric hip study groups. The survey included demographics, opinions about PA, and 10 case scenarios that queried respondents on PA duration, intensity, and restrictions they would recommend for children with Developmental Dysplasia of the Hip (DDH), Perthes Disease (Perthes), and Slipped Capital Femoral Epiphysis (SCFE). Consensus on binary questions was standardized on a 0–1 scale, with 0 indicating 50% consensus and 1 indicating 100% consensus.

Summary of Results 51 responses were received. While 81% of surgeons agreed that pediatric hip patients have greater risk of developing problems associated with inactivity, 54% believed that PA may compromise the hip. Surgeons were unanimous (100% consensus) in favor of the patient engaging in PA in 3/10 cases (30%) and near-unanimous ($\geq 90\%$ consensus) in 6/10 cases (60%). Average standardized consensus for recommending the daily minimum of 60 minutes of moderate to vigorous physical activity (MVPA) was 0.44. When suggesting PA restrictions, average standardized consensus was 0.34. The most frequently selected restrictions included avoiding impact (92%, 228/247) and contact activities (58%, 145/247), followed by weight-bearing activities (25%, 62/247). 56% (28/50) of surgeons expressed interest in developing guidelines. Physical therapists (100%, 28/28) and orthopaedic surgeons (96%, 27/28) were viewed as the most important healthcare providers to develop guidelines.

Conclusions While there is consensus among surgeons that children with DDH, Perthes, and SCFE should engage in PA, there is considerable variation when recommending the recommended daily MVPA minimum and regarding PA restrictions. There is substantial interest in developing standardized guidelines, with input from physiotherapists and orthopaedic surgeons seen as key.

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THE PEDIATRIC 'SPINE AT RISK' PROGRAM: 8-YEAR REVIEW OF A NOVEL SAFETY SCREENING TOOL AT A SINGLE INSTITUTION

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10.1136/jim-2021-WRMC.313

Purpose of Study Spinal cord injury (SCI) under anesthesia during non-spine procedures for pediatric patients with pre-existing spinal deformities is rare, but serious. A novel EMR-based 'Spine At Risk' (SAR) alert program was implemented at our institution in 2011 to identify these patients, trigger evaluation, and document precautions for perioperative positioning and care. We aimed to determine the rate of precautions needed for SAR patients, whether this was higher for those automatically flagged by diagnosis or by physician, and the success of the program based on number of SCI's during this time.

Methods Used We performed a retrospective chart review for all patients with a SAR alert from 2011–19, categorized by whether the patient was flagged by the system (based on an at-risk diagnosis) or assigned a SAR alert by a provider. We recorded whether and which precaution recommendations were made, as well as intraoperative SCI's.

Summary of Results Of the 3442 patients in the study, 1953 had a SAR alert activated due to a diagnosis and 1489 had an alert added by a provider. The system was 62.5% better

than providers at identifying patients who needed precautions ($p < 0.001$). For the diagnosis-flagged patients, 39% received at least one precaution form with rates for intraoperative recommendations as follows (reported as% of all forms): spinal cord monitoring (25%), fiberoptic intubation (14%), avoid c-spine flexion/extension/rotation (87%), avoid thoracolumbar flexion/extension/rotation (16%). 24% of provider-flagged patients received at least one precaution form with these recommendation rates at 6%, 6%, 30%, and 8%, respectively. No intraoperative SCI's occurred for these patients during the study.

Conclusions This study provides a long-term look at a novel safety program that was designed to prevent devastating SCI's in high-risk pediatric patients during non-spine anesthetized procedures. It was found that the system was better than providers at identifying patients who needed precautions, cervical spine precautions were the most common intervention, and no intraoperative SCI's occurred in these patients during the study. This program may serve as a model for others to apply to high-risk spines.

Health care research VI – quality improvement

Concurrent session

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Saturday, January 30, 2021

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ABSTRACT WITHDRAWN

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ANALYSIS OF PERIPARTUM CARE FOLLOWING IMPLEMENTATION OF A COMPREHENSIVE MATERNAL-NEONATAL CARE PROGRAM IN SOLUKHUMBU, NEPAL

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10.1136/jim-2021-WRMC.314

Purpose of Study Populations in remote regions of Nepal commonly struggle to access high quality maternal-neonatal care (MNC) services and have worse health outcomes. The purpose of this study was to 1) assess quality of antenatal (AN), intrapartum (IP), and postpartum (PP) care in Solukhumbu District following implementation of a comprehensive MNC program and 2) describe regional differences in program uptake.

Methods Used The study took place in Solukhumbu district of Nepal and included 12 village clusters known as Village Development Committees (VDCs). From 2015–2019 a project team consisting of Nepali and international experts implemented the MNC program, including birthing center (BC) establishment in each VDC, health worker training and ongoing quality management. Following implementation, the team conducted a standardized household survey in recently delivered women (RDW) to determine health services received

and care quality provided based on quality measures according to international best practice guidelines. RDW were identified through BC delivery logbooks and convenience sampling to complete the survey. We report outcomes of AN, IP and PP care quality stratified by geographic location.

Summary of Results 493 surveys were completed. AN care: 97% had a birth plan, 80% had anemia screening, 78% had urine screening, and 98% had a BP check. IP care: 66% of women delivered in a healthcare facility (42% birthing center; 24% hospital). Infant bag and mask, hand sanitation, and oxygen were available at 63%, 88%, and 49% of deliveries, respectively. A trained birth attendant was present for 64% of deliveries. Oxytocin was given after 52% of deliveries. 86% of infants were placed skin-to-skin after birth, 59% breastfed within one hour, and 67% were weighed after birth. PP care: 93% of RDW had a PP visit within 6 weeks, and 23% of infants had a PP visit within one week of delivery.

Geographic differences: In Eastern Solukhumbu antenatal anemia screening (53%) and urine screening (50%) was less common compared to other parts of the district (86%; 84% respectively).

Conclusions The majority of women and children received most basic MNC services with small geographic variations in MNC.

317 PATIENT PERSPECTIVES ON HOW TO PROMOTE RESPECT IN THE HEALTHCARE SETTING: FINDINGS FROM A QUALITATIVE INTERVIEW STUDY

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10.1136/jim-2021-WRMC.315

Purpose of Study Physicians and healthcare institutions have an ethical obligation to treat patients with respect, yet it is not clear what actions best demonstrate respect to patients. Therefore, it is critical to understand what actions and behaviors contribute to patients' experiences of respect in the healthcare setting.

Methods Used This was an exploratory qualitative study using semi-structured phone interviews conducted by four trained interviewers. Interviewees were participants in an ongoing genomics implementation study that took place in a diverse primary care setting. Interview recordings were audio recorded, transcribed verbatim, and de-identified. Interview transcripts were systematically coded with a coding framework developed based on iterative review of the interview guide and transcripts, and code categories were reviewed to identify predominant domains through which interviewees perceive respect. Data were managed on the cloud-based qualitative analysis program Dedoose.

Summary of Results Forty participants were interviewed, ten of which were in Spanish. Interviewees identified behaviors, actions, and policies that demonstrate respect on either an individual or organizational level. Two individual-level domains were identified: engaging with patients and being transparent. Five organizational level domains were identified: promoting safety and inclusivity, protecting patient privacy, communicating about scheduling, navigating financial barriers to care, and ensuring continuity of care.

Conclusions Patients identified efforts at both the individual and institutional levels that inform how they perceive respect in healthcare. These findings illustrate the importance of individual respectful clinical relationships and institutional efforts to promote access to care and patient safety. That is, the interconnectivity between individual and organizational actions suggests that meaningful connections with individual clinicians are strengthened by an organization that works to embody a culture of respect, thus promoting patient comfort and willingness to seek care.

318 PATIENT WORKFLOW IN A MULTIDISCIPLINARY CLEFT PALATE – CRANIOFACIAL PROGRAM

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10.1136/jim-2021-WRMC.316

Purpose of Study The BC Children's Hospital (BCCH) multidisciplinary Cleft palate - Craniofacial Program (CPP) serves the province of BC and provides individualized treatment plans based on team expertise. Past reviews of the CCP found only one third of patients are seen on time, and patients on the wait list are waiting up to an additional year beyond their recommend wait times to be seen. The purpose of this study is to review the workflow of patients through the clinic to explore the clinic's efficiency.

Methods Used A retrospective review of the CPP clinics appointment time sheets and patient charts from September 2018 to March 2019 was done. Time was categorized as either: chart being reviewed by a specialist, patient being seen by a specialist, or patient waiting to see the next specialist. These times were summarized using means and stratified by service.

Summary of Results 174 patients (53% male) were seen over 25 clinic days with a total of 781 specialist visits. Patients were 0–21 years old with the majority in the 6–11 year range and the fewest in the 18–21 year range. The mean number of patients seen per clinic was 7, while patients visited on average 4.6 specialists. Patients waited a mean time of 11 minutes between specialists. Otolaryngology had the most patient visits (163) and audiology had the least (54). Pediatrics spent the longest time reviewing a patient's chart (mean 13 min), while audiology had the least time with a chart (mean 5 min). Audio spent the longest time seeing a patient (40 min) and orthodontics the least (mean 15 min). The average time clinicians spent with the chart was similar across ages. The majority of clinic time is being used for clinicians seeing patients (38%), followed by patient waiting (33%), and clinicians reviewing a patient's chart (29%). Wait time increases over the course of clinic and decreasing towards the end, and patients are seen before the start and after the end of the clinic day.

Conclusions The CPP is running above capacity with the majority of a patient's time spent seeing a clinician, and appointments extending beyond the scheduled clinic. Without additional resources, patient's may wait longer for their appointments and miss key developmental assessments.

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DIVERSITY IS LACKING IN CLINICAL RESEARCH OF SEX CHROMOSOME ANEUPLOIDY CONDITIONSBS Avila*, S Davis. *University of Colorado, Denver, CO*

10.1136/jim-2021-WRMC.317

Purpose of Study Incorporating diversity in clinical research is crucial, however there is no literature addressing participant diversity in research on sex chromosome aneuploidy (SCA) conditions. SCAs, such as Klinefelter and Turner syndromes, affect 1 in 400 individuals but are understudied, and we hypothesized there are large disparities in the studies that do exist.

Methods Used We conducted a scoping review of the literature with two specific aims: 1) quantify the proportion of SCA studies that report race, ethnicity, and/or a measure of socioeconomic status (SES) for participants, and 2) compare the reported diversity of these samples to the expected population. Standardized search criteria were used in Medline and Cochrane databases to identify clinical research studies that enrolled participants with an SCA condition in the US with results published in one or more peer-reviewed journals from 1995–2020. 965 studies were identified from the original search criteria and 100 met our inclusion criteria. Descriptive statistics were used to summarize data and a one-sample t-test was used to compare the prevalence of Non-Hispanic White (NHW) participants to the expected population prevalence in the US per Census reports.

Summary of Results Only 17.8% of the studies on SCA conditions published both race/ethnicity and a measure of SES in their study sample. An additional 20 studies reported either racial/ethnic or SES breakdown, but not both. Of those 31 studies that did report race/ethnicity, NHW participants made up $86.1 \pm 8.8\%$ of the study samples, much more than the US population (60.1%, $p < 0.0001$). Of the 25 studies that stated SES, the majority described a sample consistent with middle class or above.

Conclusions These results revealed that most SCA studies do not report important diversity metrics, and in those that do there is lack of diversity in the study participants. This can be explained by many barriers that minorities and lower SES individuals face in clinical research and efforts to alleviate this disparity in future SCA research through targeted resources is warranted.

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FAITH-BASED AND FEDERAL GOVERNMENT-AFFILIATED TRAINING SITES FOR PRIMARY CARE: IMPLICATIONS FOR WOMEN'S HEALTH SERVICESAN Nguyen*, N Tan, E Godfrey, AH McClintock. *University of Washington, Seattle, WA*

10.1136/jim-2021-WRMC.318

Purpose of Study To evaluate the number of U.S.-based internal medicine (IM) primary care track programs that have continuity sites that are religiously affiliated and/or VA based clinics.

Methods Used Using FREIDA™, an online database, we identified 232 IM programs with primary-care tracks, which were confirmed by visiting each IM program's websites. We determined whether the main sponsoring residency program was faith-based, had continuity clinics at religiously affiliated

hospitals, and/or were affiliated with the VA. Religious affiliation was confirmed using Catholic Healthcare Directory.

Summary of Results Among 232 U.S. accredited IM residency with primary care tracks, 51 (22%) of these residency programs are affiliated with catholic/Christian-based hospitals, and 84 (36%) with VA-affiliated hospitals. Out of six US regions, the Midwest has the highest proportion (42%) of religiously affiliated residency programs, whereas the New England region has the highest proportion (47%) of VA-affiliated programs. When compared by residency class size, small sized class (≤ 10) has the highest percentage of religiously affiliated programs at approximately 33%. The large sized class (≥ 50) has the highest VA affiliated program percentage of 73%.

Conclusions Approximately 58% of U.S.-based IM programs with primary-care tracks would potentially limit family-planning training based on religious doctrine or federal laws prohibiting services such as early abortion care. This creates a barrier for primary care physician trainees to receive adequate family-planning training. Further studies should assess whether these programs have any strategic approaches to ensure family training for primary-care physician trainees.

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DEPRESSION AND ANXIETY SCREENINGS FOR WOMEN WITH POLYCYSTIC OVARY SYNDROME WITHIN VETERANS AFFAIRS TRAINING PROGRAMS: A PILOT STUDY ON RESIDENT PERCEPTIONM Vu*, AL Nelson, Y Fernandez-Sweeny. *Western University of Health Sciences, Pomona, CA*

10.1136/jim-2021-WRMC.319

Purpose of Study The prevalence of depression and anxiety amongst women with PCOS are higher than in the general population. It is recognized that Veterans Affairs (VA) hospitals provide care for potentially higher stressed populations versus their civilian counterparts. Women seeking care in VA clinics may have greater levels of stress. We surveyed primary care residents in training programs to see what screening was performed.

Methods Used IRB approval was obtained on an exempt basis from the *Human Subjects Committee of Western University of Health Sciences*. VA residency directors were sent an email that described the study and provided a survey link that they could share with their residents. Residents who clicked the link were directed to our voluntary, anonymous *Qualtrics* survey, that included 13 multiple choice and 4 Likert scale questions covering quantitative and qualitative aspects of resident perception. Pregnant women were asked to self-exclude.

Summary of Results Forty residency directors were contacted; 2 had no further VA relations. Twenty-six residents responded; 25 completed the survey. Forty-six percent of respondents were Caucasian, 42% female, 76% specialized in family or internal medicine, and 27% served in the armed forces. Over 88% of respondents knew the associations between PCOS and endometrial cancer, cardiovascular disease, or fertility challenges. Eighty percent said they saw 1–2 PCOS patients per month, and 80% provided postpartum care. Routine screening for depression and anxiety was reported by 31% of residents

for PCOS women and 25% for postpartum women. Another 35–40% of residents reported screening only symptomatic women. Approximately 40% of residents tend to use the abbreviated *Patient Health Questionnaire* when screening. While 87% of residents were comfortable or somewhat comfortable with discussing depression and anxiety, 90% reported that it was strongly or somewhat difficult to find time and appropriate referrals.

Conclusions As PCOS itself undergoes rapid changes in both its diagnosis and management, studying a potentially higher stressed population such as the VA, highlights the need to implement more widespread routine screening for depression and anxiety in PCOS women.

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PERCEIVED DISPARITIES IN KNOWLEDGE AND ACCESS TO REPRODUCTIVE HEALTHCARE SERVICES IN ARMENIAN AMERICAN YOUTH

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10.1136/jim-2021-WRMC.320

Purpose of Study The purpose of this study was to assess perceived gender disparities among young Armenian Americans about their knowledge and access to adequate reproductive healthcare. A secondary objective was to explore a possible association between one's source of reproductive knowledge and their perceived confidence to make informed decisions.

Methods Used An anonymous online survey was administered to Armenian men and women between the ages of 18 and 30. The survey was sent by Armenian organizations to their members from 07/31/20 to 09/15/20. The questions addressed participants' age, source of reproductive knowledge, perceptions of access to reproductive care in their local community, questions designed to objectively assess their factual knowledge regarding the safety and efficacy of contraceptives, as well as their perceived confidence to make informed reproductive care decisions for themselves.

Summary of Results A total of 122 participants were included in the analysis, of which 55.7% were females, and 42.6% were between 24 and 26 years of age. A total of 319 sources of contraception knowledge were reported with an average of 2.62 sources per participant. School (27.6%), online (23.8%) and friends (22.3%), were among the most common choices for the source of contraception knowledge. 23.5% of women agree or strongly agree that they have access to reproductive health care that is structured to the needs of Armenian women ($p < 0.0001$). 45.3% of men agree or strongly agree that they have access to reproductive health care that is structured to the needs of Armenian men ($p = 0.007$).

Conclusions A statistically significant gender disparity was observed among men and women, such that young Armenian women perceived that access to reproductive healthcare needs of both Armenian men and women are not adequately met, more so than men. Future studies could focus on specific perceived gaps in Armenian healthcare. Further, the most frequent source of reproductive care knowledge was reported to be acquired through school, followed by online, then friends. However, no significant association between

participant's age and perceptions of contraceptive usage was observed.

Infectious diseases II

Concurrent session

1:55 PM

Saturday, January 30, 2021

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ONLINE CONTENT ABOUT PRENATAL TDAP VACCINATION USING REDDIT

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10.1136/jim-2021-WRMC.321

Purpose of Study The Centers for Disease Control and Prevention (CDC) reported in 2017 that only 50.4% of pregnant women received the Tdap vaccination to protect their newborns from pertussis; 21.7% were unaware they needed it and 18.3% were concerned about adverse effects on their baby. This study investigated common concerns women expressed online regarding Tdap in pregnancy and assessed accuracy of online content using *Reddit*, a popular discussion website.

Methods Used We used *Reddit*'s built-in search engine to find user-generated posts by searching key words related to Tdap vaccination in pregnancy. Using the same keywords, we also searched commonly appearing subreddits, which are online communities within *Reddit* dedicated to topics. Working backwards from February 29, 2020 (to avoid COVID issues), we evaluated posts and comments that met the following inclusion criteria: posts from U.S. users with at least 10 comments; posts and comments focused on Tdap in pregnancy. Comments from automated bots or users outside the U.S. were excluded. Using the idea of saturation, *Reddit* posts with over 50 comments were analyzed until the 50th comment or until 4 subthemes were found. The CDC guidelines were used to judge accuracy.

Summary of Results 100 *Reddit* posts with 2872 comments between February 2020 to October 2018 were included in the study. 74 *Reddit* posts sought advice on Tdap vaccination, safety/side effects, and who need Tdap. Out of the 2872 comments, 115 contained inaccurate content; 96% of those related to the recommended frequency of the pertussis vaccination. Common themes within the comments included: cocooning (a strategy to protect infants by vaccinating close contacts); why and when pregnant women should get Tdap; and side effects. The most prevalent subtheme pertained to visitation rules for those who declined Tdap. Few comments reflected more extreme opinions, such as 'only illegal immigrants have pertussis.'

Conclusions Although most pregnant women on *Reddit* support the recommendation for Tdap in pregnancy, some users report inconsistent information received from their clinicians. Confusion still remains about who should receive Tdap. There is potential for improved patient education provided by clinicians to ensure their pregnant patients have accurate and complete information about Tdap.

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ASSESSMENT OF THE EFFICACY OF ANTIMICROBIAL PROPHYLAXIS FOLLOWING DOG BITES

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10.1136/jim-2021-WRMC.322

Purpose of Study Every year in the United States, there are approximately 4.5 million dog bites which account for about 1% of all emergency department visits. No clear guidelines exist for prescribing antibiotic prophylaxis in healthy children following a dog bite. The aim of our study was to assess antibiotic prophylaxis following dog bites and the subsequent rates of infection at follow up visits in children. The primary research question is whether there is an association between prophylactic prescription of any antimicrobial and return visit within 14 days for infection.

Methods Used We employed a retrospective cohort analysis of medical and pharmacy claims derived from the Truven Health Analytics Market Scan Commercial Claims and Encounters Database from 2016 and 2017 to assess the frequency of antibiotic prophylaxis prescribed following dog bite injuries in patients 0–18 years old and subsequent return visits for infection. We used the ICD-10 code W54 for dog bites then used keyword searches to find diagnosis (including infection) and medications.

Summary of Results Over the two year period, 24,088 children were seen for dog bites. Of these, 1,177 initially had signs of infection and were excluded from the study. Of the 22911 patients seen for dog bites that were not initially infected, 13,094 (57.2%) were prescribed an antibiotic at the initial visit and 9817 (43.8%) were not. A small number (n=265) of children who did not initially present with infection returned within 14 days for suspected infection. Of those, 186 (70.2%) received prophylactic antibiotics at the initial visit. Prophylactic antibiotic prescription at the first visit was significantly associated with presenting for an infection at the follow-up visit (OR=1.8; 95% CI=1.4,2.3).

Conclusions Patients who were prescribed prophylactic antibiotics at the initial visit for a dog bite injury were significantly more likely to return for infection. This may be explained by confounding by indication, wherein patients prescribed prophylactic antibiotics were more likely to return for care because their dog bites were initially more severe.

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TWO CASES OF HUMAN ORF RESEMBLING INTRAVASCULAR LYMPHOMA, ANGIOLYMPHOID HYPERPLASIA WITH EOSINOPHILIA, AND LYMPHOMATOID PAPULOSIS

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Case Report 1 A 17yo male who raised sheep presented to clinic with a three-week history of two nodules on his forehead. Sheep he handled were known to be infected with 'sour mouth disease'. Histologic sections demonstrated irregular epidermal acanthosis and a brisk lymphocytic infiltrate that included numerous eosinophils. Increased numbers of vessels lined by plump endothelial cells were also evident on staining for endothelial cell marker CD31. Several ectatic vessels contained large, hyperchromatic lymphocytes,

many of which showed strong immunoreactivity for CD30 antigen.

Case Report 2 A young woman who raised sheep presented to clinic with a two-week history of a nodule on her hand and a newly formed papular eruption with vaguely annular patches on the face, arms, palms and soles. Palmar and plantar lesions resembled erythema multiforme. Biopsy of the nodule on the dorsal aspect of the left hand demonstrated an acanthotic and ulcerated epidermis with rare eosinophilic inclusion bodies in the cytoplasm of keratinocytes and a brisk lymphocytic infiltrate with numerous large, atypical CD30+ cells. A punch biopsy of the rash taken from the arm showed a superficial and deep perivascular lymphocytic infiltrate with many eosinophils and no epidermal changes. These histopathologic features are consistent with a dermal hypersensitivity reaction and could easily be mistaken for a drug reaction.

Discussion Case 1 is to our knowledge the first report of orf with CD30+ atypical lymphocytes confined to the intravascular space in widely dilated vessels, resembling intravascular lymphoma. Case 1's reactive vascular proliferation with vessels lined by plump endothelial cells accompanied by a brisk lymphocytic infiltrate with many eosinophils also bore some histological resemblance to angiolymphoid hyperplasia with eosinophilia (ALHE), which has not been described in literature.

Case 2 demonstrates CD30+ atypical lymphocytes densely clustered throughout the dermis and is histologically indistinguishable from lymphomatoid papulosis (LyP) and a generalized maculopapular reaction that clinically and histologically resembled a hypersensitivity reaction to a drug.

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FACTORS ASSOCIATED WITH FIRST-LINE PENICILLIN TREATMENT AMONG WOMEN DIAGNOSED WITH SYPHILIS DURING PREGNANCY IN BRAZIL FROM 2010–2018

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Purpose of Study Despite enhanced global public health efforts, rates of maternal syphilis have quadrupled in Brazil in the past decade. Even after a benzathine shortage in Brazil from 2014 to 2017, penicillin remains the only recommended treatment. The purpose of this study was to explore whether high non-treponemal titers ($\geq 1:16$) predict treatment with penicillin among women diagnosed with syphilis during pregnancy in Brazil between 2010 and 2018.

Methods Used Using data from the Brazilian Ministry of Health on women diagnosed with maternal syphilis between January 1, 2010 and December 31, 2018, we used a random effects model with a cluster correction at the state level to evaluate whether non-treponemal titers $\geq 1:16$ are associated with penicillin treatment.

Summary of Results Among 215,937 women diagnosed with syphilis during pregnancy, 91.3% received penicillin, and 45.9% had a titer $\geq 1:16$. Maternal syphilis cases increased from 8,704 in 2010 to 46,340 in 2018 (p-value <0.001). There was significant variation by state; highest prevalence in São Paulo (n=52,451) and Rio de Janeiro (n=26,838). In the

random effects model, a non-treponemal titer $\geq 1:16$ was associated with a 41% increased odds of receiving penicillin (adjusted odds ratio 1.41, 95% confidence interval 1.36–1.45). On average, women with a titer $\geq 1:16$ were 2.5 percentage points more likely to receive penicillin, suggesting providers may use a titer threshold of $\geq 1:16$ in the decision process. Age ≥ 30 , self-identified non-white race/ethnicity, and years after 2012 also showed slightly increased odds of adequate penicillin treatment.

Conclusions High titers were significantly associated with penicillin treatment. Future studies are required to explore whether non-penicillin treatment in women with titers $<1:16$ contributed to rising maternal syphilis rates in Brazil. States with a high prevalence may benefit from targeted public health interventions to quell the epidemic.

327 METAGENOMIC NEXT GENERATION SEQUENCING OF CEREBROSPINAL FLUID IN ANTIBIOTIC PRE-TREATED, CULTURE NEGATIVE BACTERIAL MENINGITIS

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Purpose of Study Cerebrospinal fluid (CSF) obtained after initiation of antibiotics may be sterile in the setting of meningitis. Knowledge of a specific pathogen, though, may guide antibiotic selection and duration of therapy. We used metagenomic next generation sequencing (mNGS) on CSF from an infant with presumed meningitis who was pre-treated with antibiotics prior to lumbar puncture (LP).

Methods Used A nucleotide stabilizing agent was added to residual CSF with subsequent freezing at -80°C prior to analysis. mNGS was performed on the Illumina MiSeq after enrichment by hybridization, with sequences entered into the Kraken pipeline for taxonomic labelling.

Summary of Results A 5-week-old, 33 week gestational age boy presented with acute lethargy and apnea. Initial attempts at an LP were unsuccessful. Ampicillin and ceftazidime were begun. His blood culture demonstrated growth of *Streptococcus agalactiae*, which prompted another LP attempt 32 hours after initiation of antibiotics. His CSF demonstrated 1,392 white blood cells/mm³ with a neutrophilic predominance (63% polymorphonuclear cells), 6 red blood cells/mm³, a glucose of 8 mg/dL, a protein of 241 mg/dL and a Gram stain with numerous Gram positive cocci. His CSF indices were consistent with bacterial meningitis, but his CSF culture remained sterile likely due to antibiotics received prior to culture collection. The child recovered after 14 days of ampicillin. Results from mNGS of his CSF demonstrated 4,009 sequencing reads consistent with *Streptococcus agalactiae*.

Conclusions mNGS sequencing detected a meningitic pathogen matching a blood isolate when CSF culture failed to do so. This approach may be beneficial in antibiotic pretreated CSF in which cultures may be unreliable.

328 DISSEMINATED TRICHOSPORONOSIS IN A TWO-YEAR-OLD WITH ACUTE LYMPHOBLASTIC LEUKEMIA

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Introduction Trichosporonosis is a rare, emerging opportunistic infection in immunocompromised hosts. Among *Trichosporon* species, *T. asahii* has been reported to cause invasive infections and is associated with high morbidity and mortality. We describe a two-year-old with acute lymphoblastic leukemia (ALL) who developed disseminated trichosporonosis while on antifungal prophylaxis.

Case Description A previously healthy 2-year-old male presented to our institution with newly diagnosed pre B-cell ALL. During induction chemotherapy, he became neutropenic and subsequently developed fever. He was on antifungal prophylaxis with caspofungin at that time. His physical examination was notable for nodular lesions on the bilateral upper and lower extremities, including his palms and soles and nodular lesions on his chest and extremities. He was started on intravenous cefepime, vancomycin and liposomal amphotericin B. Laboratory evaluation was significant for profound neutropenia, thrombocytopenia and anemia. CT scan showed hypoenhancing lesions in the kidney and spleen and colitis. His blood and urine cultures were negative. Due to persistent fevers, posaconazole was added to his antimicrobial regimen.

Skin biopsy was performed and detected *Trichosporon asahii* DNA with 28S and ITS primer sets. Fungal culture of the skin biopsy revealed growth of *Trichosporon asahii* with an MIC of 0.25 to posaconazole, 0.06 ug/ml to voriconazole, 2 ug/ml to fluconazole and 0.25 ug/ml to liposomal amphotericin B. Posaconazole was replaced with voriconazole with continuation of liposomal amphotericin B. Twelve weeks after initiation of therapy, nodular lesions resolved and fever curve improved.

Conclusions Our case demonstrates the importance of considering trichosporonosis in children with a hematologic malignancy with persistent fever and neutropenia, especially with increasing use of echinocandins as antifungal prophylaxis. Common clinical manifestations include persistent fevers with involvement of the lungs, skin, eyes, kidneys and liver. Treatment of invasive infections can be challenging in the setting of persistent neutropenia.

329 CAVITARY COCCIDIOMYCOSIS IN PATIENTS WITH DIABETES MELLITUS

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10.1136/jim-2021-WRMC.327

Purpose of Study Pulmonary Coccidioidomycosis (PCM) is endemic to the Southwestern United States and Mexico. Its clinical manifestations vary depending on extent of infection and immune status of the host. Many infections are common and complicated in persons with diabetes. This may be caused by any number of immune alterations. People with diabetes mellitus (DM) are more likely to experience severe coccidioidomycosis and cavitary lung disease is common. Cavitation in these patients represents chronic disease and clinicians use size, location, wall thickness, and number to characterize them. The purpose of this study is to evaluate pulmonary cavitary coccidioidomycosis in DM.

Methods Used Approval was obtained from the Institutional Review Board, Kern Medical. A retrospective chart review was conducted on the records of patients with proven PCM and DM. We evaluated the records for radiographic reports, chest

x-rays (CXR), and computed tomography (CT) imaging for these patients and assessed their cavitory lesions. The location, number, and size were recorded.

Summary of Results We reviewed the imaging for 110 diabetic patients with PCM and found 52/110 (47%) patients with at least 66 cavities, as 14/52 (27%) patients had multiple cavitations. 38/66 (58%) lesions were found in the upper lobes, 25/66 (38%) in the lower lobes, and 3/66 (4%) were right middle lobe lesions. 33/66 (50%) cavities were located the right lung, and 33/66 (50%) localized in the left lung. We defined size of the lesion as the single greatest dimension, when known. The size of cavities varied greatly, ranging from 7 mm to 60 mm, with a mean size of 26.5 mm. The median value was 25 mm, and the mode was 21 mm. The American Diabetic Association classifies controlled Diabetes as patients with a glycosylated hemoglobin (HBA1c) of < 7.0%. 46/52 (88%), of our diabetic population had uncontrolled diabetes, 2/52 (4%) had controlled diabetes. We were unable to determine glucose control for 4/52 (8%) of our patients.

Conclusions Cavitory disease is substantially more common in uncontrolled diabetic patients than in the typical population of individuals with primary pulmonary coccidioidomycosis. Efforts to improve glycemic control in diabetic patients may be of value in preventing progression to cavitory pulmonary coccidioidomycosis.

330 YET ANOTHER COMPLICATION OF E-CIGARETTE OR VAPING PRODUCT USE: PULMONARY ASPERGILLOSIS

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10.1136/jim-2021-WRMC.328

Purpose of the Study Nationwide, 82% of patients hospitalized with e-cigarette, or vaping product use-associated lung injury (EVALI) endorsed vaping tetrahydrocannabinol (THC) products. As of February 2020, 2807 cases of EVALI were reported to the CDC. Of these, 15% occurred in patients <18 years old; 78% reported obtaining their supplies from friends, online vendors and unregulated dispensaries. This increases the risk of secondary infections from contaminated cartridges.

We describe a case of invasive pulmonary aspergillosis (IPA) as a complication of EVALI in an immunocompetent adolescent that resulted in a fatal outcome.

Summary of Results A 16-year old male presented to our institution with a 1-week history of fever, cough, and chest pain. On examination, he was in severe respiratory distress with decreased breath sounds bilaterally. His temperature was 37.8 C, pulse 117 bpm, BP 116/77, RR 44, and Pox 70%. He was placed on BiPAP but continued to decompensate, requiring emergent intubation. Laboratory evaluation showed a WBC of 12,400/uL, (75%N, 2% E). Blood culture and respiratory viral studies were negative. His urine drug screen was positive for THC. CT chest demonstrated pleural effusions, diffuse ground glass opacities, and bibasilar cavitation. His family later revealed that he regularly used vaping devices.

He was empirically started on ceftriaxone, vancomycin, azithromycin and amphotericin B for suspected community-acquired pneumonia and coccidioidomycosis. Due to poor response to treatment, he underwent a bronchoscopy with BAL which revealed blood-tinged secretions, 9200 RBC/mcL, 85% neutrophils, and alveolar macrophages positive for lipid

in Oil-O-Red stain, concerning for EVALI. His BAL cultures demonstrated growth of *Aspergillus niger*, indicative of invasive pulmonary aspergillosis (IPA). Voriconazole was added to his antimicrobial regimen; however, the child acutely developed pulmonary hemorrhage and succumbed to his illness.

Conclusions Our case emphasizes IPA as a potential risk associated with EVALI, especially among adolescents who may acquire THC from unregulated sources. We encourage physicians that are considering the diagnosis of EVALI to be cognizant of the increased use of THC among EVALI patients and the potential for contaminants in vaping cartridges.

Surgery V

Concurrent session

1:55 PM

Saturday, January 30, 2021

331 BEWARE THE TRANSVERSE PLANE: VARIABILITY OF 'NORMAL GAIT' IN TYPICALLY DEVELOPING CHILDREN

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10.1136/jim-2021-WRMC.329

Purpose of Study Pediatric orthopaedic surgeons use 3D Gait Analysis (3DGA) to characterize gait patterns and recommend treatment. To improve the differentiation of pathologic from normal gait, this prospective cohort diagnostic study aims to quantify the variability of kinematic measurements in typically developing children.

Methods Used 3DGA was performed using a 12-camera infra-red system. Each stride was normalized to 101 points for 14 kinematic measurements for each limb. Using a custom MATLAB program, the average range and standard deviation were

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| | Kinematic Measurement | Average Range (deg) | | Average Standard Deviation (deg) | |
|--------|-------------------------|----------------------------|-------|----------------------------------|-------|
| | | * = Significant (p < 0.05) | | * = Significant (p < 0.05) | |
| | | Left | Right | Left | Right |
| Trunk | Trunk Rotation | 9.5* | 9.4* | 3.3* | 3.4* |
| | Trunk Tilt | 6.7 | 6.4 | 2.4 | 2.3 |
| | Trunk Lateral Bend | 4.6 | 4.5 | 1.6 | 1.6 |
| Pelvis | Pelvic Rotation | 7.8* | 7.8* | 2.8* | 2.8* |
| | Pelvic Tilt | 4.4 | 4.4 | 1.6 | 1.6 |
| | Pelvic Obliquity | 3 | 2.9 | 1.1 | 1.1 |
| Hip | Hip Rotation | 8 | 8.3* | 2.8 | 3* |
| | Hip Flexion | 6.6 | 6.3 | 2.3 | 2.3 |
| | Hip Adduction/Abduction | 4.2 | 4.1 | 1.5 | 1.5 |
| Knee | Knee Rotation | 4.8 | 4.7 | 1.7 | 1.8 |
| | Knee Flexion | 10.1* | 8.8* | 3.5* | 3.2* |
| | Knee Varus/Valgus | 1.7 | 1.7 | 0.6 | 0.6 |
| Ankle | Foot Progression Angle | 12* | 10.4* | 4.1* | 3.8* |
| | Ankle Dorsiflexion | 8.3 | 7 | 3 | 2.6 |

calculated for each measurement. Paired and unpaired t-tests, linear regression analyses, and one-way ANOVA with Tukey's Post Hoc were utilized to assess the impact of age, sex, and kinematic measurements on variability.

Summary of Results 37 patients were recruited for the study (ages 5.3–16.8 years; 20F,17M). 3DGA captured an average of 7 strides for each patient. Variability was greatest in the transverse (rotational) plane for the trunk, pelvis, hip, and foot/ankle, whereas the knee was most variable in the sagittal plane (table 1). Variability decreased as age increased. Sex had no statistically significant difference for any measurement.

Conclusions Typically developing children have the greatest kinematic variability in the transverse plane. In particular, the foot progression angle can have up to a 12° average range, indicating that surgeons should not utilize a single stride in isolation to determine treatment of transverse plane deviations such as intoeing. Determination of fixed pathological gait patterns may be more accurate as children reach skeletal maturity.

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THE INFLUENCE OF PROPHYLACTIC CEMENT AUGMENTATION ON SURGICAL REVISION RATES IN SPINAL FUSION SURGERY

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Purpose of Study Spinal fusion surgeries are a common treatment for spinal disorders. However, preventing adjacent segment disease (ASD) or proximal junctional failure (PJF) requiring surgical revision remains a challenge. Prophylactic cement augmentation at the level of the upper instrumented vertebra (UIV) and UIV+1 has been proposed to reduce the risk of PJF. The purpose of this study is to compare surgical revision rates in individuals undergoing spinal fusions with and without cement augmentation.

Methods Used We conducted a retrospective chart review of 108 consecutive patients from 2015–2020, who did (N=72) and did not (N=36) receive cement augmentation at the UIV or UIV+1 levels concurrently with their spinal fusion surgeries treated by the department of orthopedic surgery at UCSD. A multivariate logistic regression model was used to determine the odds of failure within 1 year of surgery controlling for covariates of age, number of levels fused, presence of osteoporosis, comorbidities, and whether the index surgery was primary or a revision.

Summary of Results 6/72 (8.3%) cement group patients and 6/36 (16.7%) control group patients experienced mechanical failure within one year postoperatively. In the cement group, the mean (SD) number of levels fused was 5.1 (2.3), the mean (SD) age was 69.0 (9.4) years, and the mean (SD) number of levels cemented was 3.2 (1.7). 24/76 (31.6%) had UIV cement augmentation, 20/76 (26.3%) had UIV+1 cement augmentation, and 28/76 (36.8%) had both UIV and UIV+1 cement augmentation. In the control group, the mean number of levels fused was 3.5 (1.9) and the mean age was 64.6 (9.7). The results of the adjusted model indicated that patients not receiving cement augmentation as part of their surgical fusion were significantly more likely to require revision

surgery within 1 year of the index surgery ($p=0.037$, OR (95% CI) = 4.906 (1.101–21.860).

Conclusions Prophylactic cement augmentation of the UIV and UIV+1 may warrant increased consideration in the standard of care for patients receiving spinal fusion surgeries to improve clinical outcomes and to reduce surgical revision rates in this patient population.

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BIOMECHANICAL COMPARISON OF KNOTTED TRANSOSSEOUS EQUIVALENT VERSUS SPEED-BRIDGE ROTATOR CUFF REPAIR TECHNIQUES: A SYSTEMATIC REVIEW

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Purpose of Study The purpose of this study was to systematically review the literature in order to compare the biomechanical outcomes of knotted transosseous equivalent (TOE) and knotless transosseous equivalent (KL-TOE) rotator cuff repair (RCR) techniques.

Methods Used A systematic review was performed according to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines using PubMed, Embase, and the Cochrane Library to identify studies that compared the biomechanical outcomes of knotted TOE and KL-TOE (Speed-bridge) rotator cuff repair techniques. The search phrase used was (Double Row) AND (rotator cuff) AND (repair) AND (biomechanical). Data pertaining to the biomechanical properties of each surgical technique were extracted from each study.

Summary of Results A total of 9 studies (150 cadaveric shoulders) met the inclusion criteria. Of the 9 studies, 6 showed improved biomechanical properties using the knotted TOE method compared to KL-TOE RCR technique. Ultimate load to failure ranged from 310 ± 82 N to 549 ± 163 N in knotted TOE repairs while ranging from 166 ± 87 N to 416.8 ± 120.0 N in KL-TOE repairs. 1 study found no significant difference in medial row fixation point displacement, construct stiffness, and ultimate load to failure when comparing knotted and knotless medial anchor fiberwire sutures in a transosseous-equivalent double-row rotator cuff repair. Of the remaining 2 studies, 1 indicated that KL-TOE repair shows an improved self-reinforcement effect, without diminishing footprint contact, compared to the same repair with medial knots. The other study suggested strain at the medial suture level was significantly greater when the medial sutures were tied compared with those untied. Qualitative and quantitative analyses of the data are underway.

Conclusions Preliminary results of this systematic review indicate that the biomechanical properties of yield load, ultimate load, footprint contact area, and footprint pressure are significantly improved with reduced gap formation in knotted TOE rotator cuff repairs compared to KL-TOE repairs. The knotted medial stitch increases the strength of the construct, but some studies found it may also increase tears.

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'SHAGGY AORTA' PROTOCOL – UTILIZING THE BENEFITS OF BOTH ANTEGRADE AND RETROGRADE CEREBRAL PERFUSION FOR ALL OPEN AORTIC ARCH OPERATIONS

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10.1136/jim-2021-WRMC.332

Purpose of Study Despite advances in neuroprotective strategies for open aortic arch surgery utilizing hypothermic circulatory arrest (HCA), stroke related to propagation of thromboembolic remains a potentially devastating complication. Patients can develop cerebral infarcts bilaterally regardless of extent of arch repair and even without preceding risk factors. These observations prompted us to combine the metabolic benefits of selective antegrade cerebral perfusion (SACP) with the potential benefit of retrograde cerebral perfusion (RCP) to flush out embolic debris in a strategy called 'Shaggy Aorta' Protocol.

Methods Used 'Shaggy Aorta' Protocol was applied in 48 patients between 2018–2020. After median sternotomy, arterial cannulation for cardiopulmonary bypass, and cooling to moderate hypothermia (26–28°C), HCA was initiated for reconstruction of the distal anastomosis. For 40 patients, a 3-minute period of RCP was administered through the SVC at a rate of 1.5–2 L/min with a goal CVP of 20–30 at the start of HCA followed by SACP. In the remaining 8 patients, only RCP was administered as the HCA period was anticipated to be short. 'Shaggy Aorta' Protocol patients were also compared to our institutional cohort of patients who received only SACP during circulatory arrest for arch operations using bivariate analysis and propensity matching.

Summary of Results There were no differences in patient characteristics before and after propensity matching. None of the 'Shaggy Aorta' Protocol patients developed postoperative neurologic deficits, and all were discharged in good condition. Stroke was significantly higher in patients receiving only SACP ($p = 0.004$) and remained so after propensity matching ($p = 0.017$).

Conclusions Embolic stroke remains a significant risk even when a nidus for propagation is not immediately apparent. The use of retrograde cerebral perfusion may allow for flushing out of embolic debris, thus eliminating a source of stroke. Our early experience utilizing a strategy of retrograde cerebral perfusion for the washout of potential arterial thromboembolic debris as an adjunct in aortic arch repair with HCA shows promising improvements in neurologic outcomes compared to SACP alone.

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CHANGES IN CLINICAL PATHWAYS AND FUNCTIONAL OUTCOMES OF CHILDREN WITH UPPER BRACHIAL PLEXUS BIRTH INJURY BEFORE AND AFTER INSTITUTION OF SUP-ER PROTOCOL

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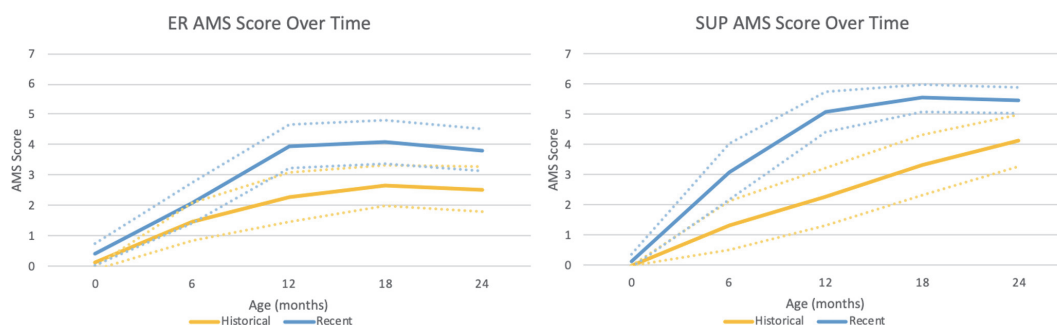
Purpose of Study Children with brachial plexus birth injury (BPBI) to the C5, C6 ± C7 roots who do not recover on their own in the first 2 months of life, require medical treatment. Most clinics recommend non-surgical (physiotherapy, occupational therapy, splinting) and procedural interventions (nerve grafting, muscle release, tendon transfers, Botox injections). We published a pilot study showing that an early shoulder repositioning protocol (Sup-ER) had better supination and external rotation outcomes at 2 years of age compared to a control group.

The goal of this study was to expand the pilot and audit changes in our clinic's choice and timing of surgical interventions and outcomes of Sup-ER protocol patients compared to historical controls.

Methods Used The health records of upper BPBI patients who had procedures at BC Children's Hospital from 2001–2018 were retrospectively reviewed. The study population was grouped by birth year into a historical pre-Sup-ER (2001–2008, $n = 20$) and recent Sup-ER (2009–2018, $n = 21$) group. Data relevant to surgical type and timing, and functional outcomes were collected and analyzed.

Summary of Results Compared to the historical group, there were less brachial plexus exploration and grafting surgeries performed in the recent group. Botox injections, nerve transfers and tendon transfers were performed earlier and more frequently in the recent group. Infants in the recent group had better functional outcomes at 2 years of age as measured by Active Movement Scale (AMS) scores.

Conclusions Currently, brachial plexus exploration and grafting is rarely performed in this group and children with upper BPBI who follow the Sup-ER protocol are recommended earlier and for more 'other' procedures compared to historical controls. This evolution of clinical pathway results in improved outcomes at 2 years of life compared to historical controls.



Abstract 335 Figure 1

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TRANSCRANIAL MAGNETIC STIMULATION IN PEDIATRIC EPILEPSY: VALIDATION OF A NONINVASIVE, PRESURGICAL MOTOR MAPPING TECHNIQUE

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Purpose of Study Navigated transcranial magnetic stimulation (nTMS) is a non-invasive technique often used for localization of functional motor cortex via induction of motor evoked potentials (MEP) in neurosurgical patients. There has however been no published record of its application in pediatric epilepsy surgery. This study aims to evaluate the success of using nTMS for pre-surgical motor mapping in a cohort of pediatric patients with medically refractory epilepsy.

Methods Used All patients of age 0–18 with a diagnosis of medically refractory epilepsy were identified from the institutional database of pre-surgical nTMS motor maps (2012 to present). The patient's demographic, clinical, and mapping data were extracted and used for statistical analysis.

Summary of Results Sixteen patients met the inclusion criteria. Fifteen patients underwent surgical resection. Median age was 9 years (range 0 - 17 years). No adverse effects were recorded during mapping. Specifically, no epileptic seizures were provoked via nTMS. Recordings of valid MEPs induced by nTMS were obtained in 10 patients. In the remaining patients, no MEPs could be elicited. Failure to generate MEPs was associated significantly with younger patient age ($r = 0.8020$, $p = 0.0001863$). All patients underwent surgical resection. The most frequent seizure control outcome Engel Epilepsy Surgery Outcome Scale Class I.

Conclusions nTMS is a safe, well-tolerated, and effective method for mapping the motor cortex in pediatric patients with epilepsy. Patient age modulates elicibility of MEPs, which may be related to myelination. Successful motor mapping could benefit this patient population analogous to the benefits seen in adults. Therefore, research towards and usage of nTMS for motor mapping in pediatric epilepsy patients should be expanded.

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OPEN CHEST DURATION FOLLOWING CONGENITAL CARDIAC SURGERY INCREASES RISK FOR SURGICAL SITE INFECTION

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10.1136/jim-2021-WRMC.335

Purpose of Study Surgical site infections (SSI) following congenital heart surgery (CHS) remain a significant source of morbidity and mortality with an estimated incidence of 11%. Delayed sternal closure (DSC) is often required within the pediatric population to minimize the potential for postoperative respiratory and hemodynamic instability. While repeated open chest procedures and extracorporeal membrane oxygenation have been identified as independent risk factors for SSI following DSC, the effect of open chest duration following

the primary surgery remains less well defined. Thus, the purpose of this study was to evaluate the incidences of SSI among patients with DSC versus primary closure (PCC) and to concomitantly evaluate the effect of open chest duration on SSI occurrence.

Methods Used A retrospective review of our institutional Society of Thoracic Surgeons dataset was performed to identify patients undergoing CHS at our institution between 2015 and 2020. Patients with SSI were identified within a prospectively collected institutional dataset and matched accordingly. Incidences of SSI were compared between DSC patients and patients undergoing PCC utilizing bivariate analysis. Further, patients with DSC were evaluated to determine the association of open chest duration on the incidence of SSI.

Summary of Results 2582 operations were performed in 2492 patients with congenital heart disease at our institution between 2015–2020, including 195 DSC cases and 2387 PCC cases. The incidence of SSI within the cohort was 1.8% ($n=47$). DSC patients had significantly higher incidences of SSI (8.7%) than PCC patients (1.3%, $p=0.041$, OR:6.7). Within the DSC cohort, patients that went on to develop SSI had a longer open chest duration (mean=24.7 days, SEM=10.2 days) when compared to non-SSI DSC patients (mean=6.4 days, SEM=0.71 days).

Conclusions SSI remains a significant source of morbidity following congenital cardiac surgery. The incidence of SSI is higher in patients undergoing delayed sternal closure compared to patients with primary chest closure. Further, prolonged open chest duration presents a potentially modifiable risk factor for SSI predisposition. These data support dedicated, daily post-operative assessment of candidacy for chest closure to minimize the risk of SSI.

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COMPLEX WOUND MANAGEMENT USING NEGATIVE PRESSURE WOUND THERAPY WITH INSTILLATION AND RETICULATED OPEN CELL FOAM DRESSING WITH THROUGH HOLES

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10.1136/jim-2021-WRMC.336

Purpose of Study Negative pressure wound therapy (NPWT) with instillation and dwell time (NPWTi-d), which combines periodic instillation of a topical wound solution with NPWT, can be included in the treatment strategy for both acute and chronic wounds. Additionally, NPWTi-d using a reticulated open cell foam dressing with through holes (ROCF-CC) has been shown to assist in removing wound exudate and infectious materials. We describe our experience using NPWTi-d with ROCF-CC to help manage 7 patients with complex wounds.

Methods Used In each case, NPWTi-d was initiated by instilling saline with a 1-second dwell time, followed by 2 hours of NPWT (-125 mmHg). NPWTi-d duration ranged from 5 to 27 days, with dressing changes every 2–3 days. Once sufficient granulation tissue growth had occurred, NPWTi-d was discontinued and the wounds were primarily closed with sutures, flaps, or skin grafts. In one patient, closed incision negative pressure therapy was used to support suture closure.

Summary of Results 6 of the 7 patients were male, with an average age of 61.7 years (range: 45–78 years). Comorbidities included diabetes (n=6), coronary artery disease (n=3), peripheral vascular disease (n=3), surgery for abdominal aortic aneurysm (n=2), and renal disease with dialysis (n=1). Wound types were varied and included a pharyngeal abscess that developed an extensive disseminated infection involving the left breast, soft tissue avulsions with exposed tibias without periosteum, bilateral open fasciotomy leg wounds, and a right groin exposed graft with infection. Wound cultures were positive for bacteria in 3 patients, and antibiotics were administered when appropriate. Debridements were performed as needed in 4 patients.

Conclusions The positive outcomes from these cases further support the use of NPWTi-d with ROCF-CC as a viable option for assisting in the management of complex wounds.

Published not presented

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GREATER INCIDENCES OF MENTAL ILLNESS ASSOCIATED WITH ABUSE IN HOUSING INSTABLE YOUTH?

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Purpose of Study Housing instable individuals include those who do not have an adequate or reliable place of residence at night. Experiences of abuse can lead to long-term effects due to abuse being an adverse childhood experience. The purpose of this study was to determine if abuse of any type in housing unstable youth could be associated with mental health issues including depression, anxiety, schizophrenia, and bipolar.

Methods Used 1398 self-report surveys were collected from youth that attended a day drop-in youth program in Redlands, San Bernardino County, California. Youth had an average age of 17.99 years old. These surveys ascertained their history of abuse and type of abuse. The surveys addressed their history of mental illness as well as the type of abuse they experience or have had a history of. These mental illnesses included: depression, anxiety, schizophrenia, and bipolar.

Summary of Results There were 1221 surveys completed. Statistics showed that total youth (N=1221), female youth (N=191), and male youth (N=801) with a history of abuse were statistically significant to have a history of mental health issues ($p < .00001$, $p < .00267$, $p < .00001$ respectively). Female abused children have a 157% higher odds of having mental health issues than unabused female youth. Male abused youth have a 256% higher odds of having mental health issues than unabused male youth. Overall, housing instable youth who experienced abuse had a 133% higher odds of having a mental illness.

Conclusions This study revealed that female and male housing instable youth with a history of abuse experienced a greater incidence of mental health issues in contrast to those without a history of abuse. Addressing the abuse that housing instable youth experience may be key to preventing mental health issues later in life.

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DOES HAVING MEANINGFUL TALKS WITH A CHILD AFTER A FAMILY DEATH CAUSE A DECREASE IN THE POOR BEHAVIORS AND EMOTIONS EXHIBITED BY THE CHILD?

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Purpose of Study Parental communication with the grieving child is necessary for coping. The purpose of this study was to ascertain how meaningful talks with parents/guardians impact the behaviors and emotions of the grieving child.

Methods Used Youth under the age of 18 who had a primary death in their family of a sibling or a parent attended a weekend overnight camp that included grief counseling. 809 surveys were filled out by parents addressing the campers before the death, after death pre-camp, and post-camp. From this survey, the levels of parental meaningful talks were determined. These two groups of parents with high talk and low talk values were compared against possible child scores of 15 behaviors and 13 emotions. Those who experienced a traumatic death were in the SVP group and the non-traumatic death in the CGG group.

Summary of Results The results reveal that parents/guardians of children that are considered to have high talks with their CGG children are 131% greater odds of having to have a child with high of behaviors (p -value < 0.05). In addition, they are also 279% greater odds to have higher emotions. Those in the SVP group are 56% greater odds to have more meaningful talks compared to those in the CGG. Those that are SVP do not have an association between higher meaningful talks and behaviors and emotions.

Conclusions Children who experienced death close to them from disease and who have high levels of meaningful talks with their guardians experience higher levels of behaviors and emotions. Those who are SVP have a greater number of meaningful talks than those in CGG. Those in the SVP group do not have any association between meaningful talks and behaviors and emotions. Addressing and talking to children who have experienced death is important for coping and grieving.

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PARENTAL COPING PARALLELS TO CHILD COPING IN DEATH OF A CHILD AND OR PARENT

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Purpose of Study The death of a child or spouse can deeply impact a parent and alter the parent's ability to cope and function. The way in which a family unit interacts can strongly shape the emotions and coping of a child. This study aims to determine how poor parental coping after the loss of a loved one can impact the emotional and behavioral function of the child.

Methods Used Children and youth who experienced a loss of a sibling or a parent attended a weekend camp that included group grief counseling and camp activities. 809

surveys were filled out by guardians addressing their child's emotions (13 domains) and behaviors (15 domains); prior to death then pre-camp, and post-camp. Comparisons between parent's coping on the rubrics of struggle to function and loss of interest were compared with children's emotions and behavior.

Summary of Results Children who experienced death from traumatic causes had 41% lower odds of having a parent who maintained engagement by not having a loss of interest. No other poor parental behavior of coping or child emotion correlated. No other poor parental behavior of coping or child behavior correlated.

Conclusions This study concludes that children who experienced death from traumatic causes had lower odds of having apparent who maintained engagement. The importance of this is that support for parents is important for a child coping as parents are unavailable as they are also struggling to cope.

342 A 2-YEAR-OLD WITH FEVER, PANCYTOPENIA AND HEPATOSPLENOMEGALY

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Purpose of Study *Plasmodium vivax* (*P. vivax*) malaria is a rare parasitemia in Kern County. The infections are transmitted from the *Anopheles* mosquito bite. Around 17% of infections occur in children and those with severe malarial infection and end-organ damage most are younger than 5 years old. It is critical as a differential diagnosis in pediatric patients with fever and pancytopenia in order to prevent life-threatening complications such as disseminated intravascular coagulation, splenic infarct or hemophagocytic syndrome.

Methods Used Single patient case report.

Summary of Results A 2-year-old Middle Eastern female with no past medical history presented with 5 day history of cyclic fevers associated with hepatosplenomegaly. The patient had traveled to Djibouti in East Africa 5 months before onset of symptoms. The patient was seen in the emergency department for fever and a peripheral blood smear (PBS), complete blood count (CBC) with differential, rapid influenza, urinalysis (UA), chest x-ray (CXR), reticulocyte count, and inflammatory markers were ordered. AInfluenza, UA, and CXR were negative. The PBS revealed malaria. Results showed elevated CRP 11.40, Procal 4.99 and ESR 4.99. CBC showed WBC 4.5, Hgb 7.6, Platelets 108 and 1% blast count indicating pancytopenia. Reticulocyte count was elevated at 4.6%. Pathology indicated normocytic anemia, thrombocytopenia, and gametocytes in RBCs suggestive of *P. vivax*. The patient responded to Atovaquone-Proguanil. Parasitemia improved from 0.53% to 0.07%. The CRP level downtrended to 5.17. The patient's ferritin of 206 and fibrinogen level of 456 were normal making hemophagocytic syndrome unlikely. The patient was discharged after being afebrile for > 48 hours and prescribed Primaquine for outpatient treatment.

Conclusions While *P. vivax* malarial parasitemia has a low incidence in Kern County it remains important to be identified promptly and to administer immediate treatment to prevent end-organ damage and to avoid relapse. It should be considered as a differential in a pediatric patient presenting with fever and pancytopenia. Additionally, communication with the department of public health are important for monitoring to avoid a local outbreak. Further studies are needed to help distinguish between relapsing infections and newly acquired infections.

343 A STATE-OF-THE-ART REVIEW OF REPORTED RATES OF ADVERSE CHILDHOOD EXPERIENCES IN CHILDREN

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Purpose of Study The purpose of this literature review was to summarize current rates of adverse childhood experiences (ACE) reporting in children.

Methods Used Two databases were searched, PubMed and Embase, for studies published between January 1, 2011, and August 10, 2020. Studies were included if (1) they were on a pediatric population and (2) they were an original study that reported on ACEs. The majority of articles from the initial search were excluded by screening titles and abstracts. A total of 17 articles were included: 6 assessed ACEs during a pediatric primary care visit, and 11 assessed ACEs in a non-primary care setting. A qualitative analysis of the data was performed since categorization of ACEs varied across studies.

Summary of Results Results suggested that studies administering the questionnaire in a primary care setting reported fewer patients with high ACE scores than studies that administered the questionnaire in a non-primary care setting. Studies with older age samples reported a greater frequency of high ACE scores compared to studies with younger age samples.

Conclusions Further research is needed on factors that may increase reporting in primary care settings.

Administered in Primary Care Setting (N = 6)

Abstract 343 Table 1

| Source | Age | ACE 0 | ACE 1 | ACE 2 | ACE 3 | ACE 4+ | |
|----------------------|-------|-----------------|--------|--------------------|-------|--------|-----|
| Lyengard, 2019 | 2–11 | 13% | 60% | 23% | | 4% | |
| Marie-Mitchell, 2020 | 5–11 | Exposure | 59% | 23% | 9% | 4% | 6% |
| | | Exposure + Risk | 44% | 27% | 13% | 6% | 13% |
| Mercie, 2020 | 3, 5, | | | | | | |
| | Age 3 | | 15% | | | | |
| | 10, | | Age 5 | 17.5% | | | |
| | 13 | | Age 10 | 30.5% | | | |
| | | | Age 13 | 33.8% | | | |
| Selveraj, 2019 | 0–17 | | | ACE 1+ = 49% | | | |
| Wickramasinghe, 2019 | 0–18 | Phase I | 51% | 49% (ACE 4+ = 10%) | | | |
| | | Phase II | 36% | 64% (ACE 4+ = 28%) | | | |
| Burke, 2011 | 0– | 32.8% | 30.7% | 13.8% | 10.7% | 11.9% | |
| | 20.9 | | | | | | |

Abstract 343 Table 2 Administered in non-primary care setting (N = 11)

| Source | Age | Region | Low ACE | ACE 0 | ACE 1 | ACE 2 | ACE 3 | ACE 4+ | High ACEs |
|--------------------------------------|------------------------------|--|---------|----------------------|--------|------------------------|--------|--------|-----------|
| Acheson, 2019 | 1, 2, 3, 11 | Unknown | 63.8% | | 32.1% | | | | 4% |
| Marie-Mitchell and O'Connor, 2013 | 4-5 | Urban | | 53% | | | 47% | | |
| McKelvey et al., 2018 | 1-11 | Unknown | | 19% | 31% | 27% | 23% | | |
| National Crittenton Foundation, 2012 | 5-13 | Nationwide (USA) | | | 82% | | | 18% | |
| Rengjilian, 2018 | 8th graders | Urban | | | 29.50% | 49.30% | | 21.30% | |
| Choi, 2019 | 3-16 | Urban | 29.90% | Moderate ACE = 52.1% | | | | | 18% |
| Kidman 2019 | 8-16 | Nationwide (Malawi) | | | 30.12% | | | 69.88% | |
| Abdelli, 2016 | 0-18 | Unknown | | | 11.4% | 88.6% (ACE 4+ = 42.3%) | | | |
| Gomez, 2018 | 9-18 | Nationwide | | | 53.50% | 46.5% (ACE 2+ = 25%) | | | |
| Wan 2018 | 11-19 | Urban and rural (3 provinces in China) | | | 10.6% | 89.40% | | | |
| Cawthorpe et al., 2018 | Mostly 0-18, a handful to 24 | Unknown | | | 19% | 18.60% | 14.20% | 12.30% | 35.80% |
| | | | | | 26% | 20.30% | 15.20% | 11.20% | 27.70% |

344 CLINICAL REASONING IN CHEST PAIN AND DYSPNEA IN PEDIATRICS: THE VALUE OF A COMPLETE HISTORY

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Case Report As technology has advanced, it has become easier for physicians to rely on diagnostic testing, such as labs and imaging, to arrive at the correct diagnosis. However, an incomplete history combined with being heavily influenced by diagnostic testing can cause physicians to diagnose patients incorrectly which subsequently leads to the wrong treatment plan. This can also cause significant costs to the family and society and results in low value care. This case study demonstrates how a pediatric patient was erroneously diagnosed with a pulmonary embolism which resulted in a cascade of unnecessary diagnostic testing, imaging, and treatments that were costly and potentially harmful to the patient.

An 8-year-old male, with a history of asthma and a surgical revision of his below the knee amputation two days prior, presented to the emergency department (ED) with shortness of breath, chest pain, and tachycardia which was non-responsive to albuterol both at home and in the ED. A full set of labs were ordered showing an elevated D-dimer which resulted in a CT angiogram that was read as a pulmonary embolus. He was started on anticoagulation and transferred to a tertiary children's hospital where he was admitted to the pediatric intensive care unit (ICU). While in the ICU, the CT was reviewed and the findings were found to represent artifact. On further questioning, the boy stated that his symptoms began immediately after swallowing a dry quesadilla, and the diagnosis of an esophageal food bolus as the cause of his symptoms was made.

This case study highlights the challenges associated with heuristic clinical reasoning processes and the possibility of error as a result of these cognitive shortcuts. It also illustrates that a complete history will decrease the likelihood of an incorrect diagnosis and management plan. By reviewing cases

like this one, a physician can recognize the value of a full history and mitigate their own cognitive bias in the medical decision-making process.

345 CONTRASTING AND COMMON CLINICAL AND LYMPHATIC PHENOTYPES IN NOONAN SYNDROME: THREE ILLUSTRATIVE CASES

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Purpose of Study Noonan Syndrome (NS) encompasses a set of rare genetic diseases with many phenotypic variants, all stemming from disruption of the Ras signaling pathway. We present three NS patients with lymphatic dysplasia elucidated through appropriate lymphatic imaging.

Methods Used We reviewed three of our patients with a clinical NS diagnosis. Each underwent lymphangiography (LAG) and/or lymphangioscintigraphy (LAS), documenting dysplasia along central lymphatic chain. The imaging results were used to guide medical and surgical management in each patient.

Summary of Results Patient 1 (P1) showed retroperitoneal lymphangiectasia using LAG age 15 and confirmed with LAS at age 23. He suffered chronic scrotal lymphedema and chylous leakage. A retroperitoneal lympho-venous (L-V) shunt was performed, restoring lymphatic flow per follow-up LAS at age 35 after several years of symptomatic improvement. Patient 2 (P2) showed retroperitoneal lymphatic malformations and right-ward thoracic duct deviation on LAS at age 10. P2 underwent inguinal L-V shunting and showed a marked long-term reduction in peripheral lymphedema. Patient 3 (P3) exhibited severe upper pulmonary, retroperitoneal, and intestinal lymphangiectasia with LAS at age 8. She experienced severe respiratory symptoms, a protein/lymph-losing enteropathy, hepatosplenomegaly, anemia, and chronic malnourishment by age 11. Surgical management with thoracic duct

decompression by L-V shunting has been considered but was delayed while her condition stabilized.

Conclusions These patients and a growing body of literature over several decades demonstrate that lymphatic dysplasia may be a hallmark of NS. The various lymphatic imaging modalities used in these three cases illustrate the value of initial non-invasive dynamic LAS screening in defining and monitoring the general lymphatic dysfunction status and sites of chylous/non-chylous reflux. More invasive studies such as LAG and magnetic resonance lymphangiography with contrast, preceded by MRI without contrast, provide greater detail and clarify treatment options. We propose that early lymphatic imaging should be utilized routinely to evaluate NS patients.

346 EXPANDING ACCESS TO OPIOID USE DISORDER TREATMENT VIA TELEHEALTH IN LEWIS COUNTY, WASHINGTON

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Purpose of Study Lewis County is in southwest Washington state. With a population per square mile of 31.4, Lewis County is more rural than the rest of the state (101.2 per square mile). Citizens of the county, as well as health care workers at Chehalis Family Medicine (located in Lewis County), report concerns over rates of opioid use disorder. While Lewis County's age adjusted rate per 100,000 of deaths due to opioid overdose from 2014–2017 was lower than that of Washington state (7.6 vs 9.3), its rate of opioid related hospitalizations was significantly higher (110.7 vs 81.5).

Methods Used An asset-based approach was used to learn how Lewis County has been addressing opioid use disorder amongst its citizens. Interviews with health care providers, patients at Chehalis Family Medicine, and the pastor of a local church were performed. These conversations revealed a lack of access to public transportation creates a major barrier to receiving opioid use disorder treatment. A literature review of interventions implemented in rural areas to deliver medically assisted opioid use disorder treatment was performed.

Summary of Results The recent use of telemedicine to deliver suboxone treatment at Chehalis Family Medicine has increased access to medically assisted treatment of opioid use disorder. Telemedicine has become more prevalent with some loosening of governmental regulations due to the COVID-19 pandemic. Based upon articles by Guille et al and Weintraub et al, administration of medically assisted opioid use disorder treatment via telehealth offers a means to expand access to care in rural communities. They demonstrated no significant differences in patient outcomes. Implementation of telemedicine at other suboxone clinics in Lewis County would improve access to suboxone treatment.

Conclusions A strength-based framework allows the existing assets in Lewis County to be appraised so future work can build upon what has already proved effective for the community. Regarding opioid use disorder treatment, Lewis county has several low barrier suboxone clinics which could increase access for rural patients through implementation of telemedicine. Chehalis Family Medicine's recent success with telemedicine in suboxone treatment could serve as a template for how to do so effectively.

347 SUICIDALITY IN HIGH-SCHOOL ADOLESCENTS IN JEROME, IDAHO

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Purpose of Study Suicidality of adolescents in Jerome, Idaho is a shared source of concern. A community needs assessment from St. Luke's Health System listed Idaho in the top 10 states with the highest suicide rates. Suicide is the 8th leading cause of death in Idaho, with both Idaho and Jerome suicide rates 50–60% higher than the U.S. average. Per the CDC, suicide is one of the leading causes of decreased life expectancy in the country and is the second leading cause of death in those ages 10–24. This project was established to assess the major players, their observations of current needs, what assets are present, and how they can be augmented.

Methods Used Interviews of community leaders and members alongside a literature review of in-school interventions worked in parallel to investigate the current assets of Jerome and start to develop ideas to improve upon these assets. Four major partners were discovered: Community Schools Project from the United Way, Jerome School District, St. Luke's Health System, and South Central Public Health District. All have at least one focus area in children's health, and all are interested in addressing mental health.

Summary of Results The systemic reviews assessed randomized controlled trials of in-school programs and focused on those which impacted certain categories: gatekeeper behavior/skills, increased knowledge about suicidality and its manifestations, decreasing suicidal behavior, etc. Research into smartphone apps provided another avenue of support for adolescents experiencing suicidal ideation. The research failed to provide a definitive answer as to app effectiveness, though since this generation utilizes technology more than any other before, smartphone apps may be worthy of further investigation.

Conclusions A triad of potential goals manifested during the project: build relationships and communication between major players, increase confidence and skills of 'gatekeepers' (teachers, administrators, school staff) to recognize suicidality and support students, and provide awareness of technology-based resources for students to find support outside of school. Refinement of the specific needs at Jerome High School will be the next step. Further research will be performed to determine interventions which are effective, cost-efficient, and sustainable in addressing suicidality.

348 THE EFFECT OF FAMILY STRUCTURE ON SOCIOECONOMIC AND BEHAVIORAL ISSUES

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Purpose of Study A clinician, being aware of the stress on families due to divorce or loss, and often the subsequent economic consequence can better address the impact on children and support families. As of 2018, divorce rates were 4.1/1000 of total population in California. Divorce often results in socioeconomic disadvantages and behavioral issues in children. Qualifying for fee school lunches may affect the health of

children. Household changes after divorce often lead to children running away or being kicked out. This study aims to find if single parent families are more likely to have children who qualify for free school lunch, have run away or have been kicked out.

Methods Used In San Bernardino County, children (ages 9–26) with insecure housing were surveyed. Correlations were accessed between family structure and children receiving free lunch (n=739), running away (n=634) and being kicked out (n=733).

Summary of Results A chi-square and odds ratio showed children from two parent families were 3% less likely to receive free lunch than single parent families [X^2 (1, N = 739), $p=0.85$], 76% less likely to be kicked out [X^2 (1, N = 773), $p=0.00001$], and 58% less likely to run away than single parent families [X^2 (1, N = 634), $p=0.00001$].

Conclusions Children who have experienced divorce are more likely to have experienced behavioral issues, and slightly more likely to receive free school lunch. This information can be used to develop stronger support systems for children experiencing familial issues.

A clinician, being aware of the stress on families due to divorce or loss, and often the subsequent economic consequence can better address the impact on children and support families.

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DETECTION OF CORONARY ARTERY CALCIUM DEPOSITS ON NON CONTRAST CT USING ARTIFICIAL INTELLIGENCE

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Purpose of Study According to the CDC, coronary artery disease (CAD) is one of the leading causes of death in the US, with an average of 1 in every 4 deaths being due to CAD. For some, close monitoring due to familial history allows for its early diagnosis, thus leading to early interventions that significantly reduce or delay development of pathologies. But for others, the first sign of CAD may be a myocardial infarction. This makes early detection of this disease crucial to prevent deaths. Here, we postulate a noninvasive, ‘zero additional cost’ methodology that may be used as a potential add-on screening test for calcified CAD plaques that is performed on non-contrast, non-gated chest CT’s. Since evaluating for lumen obstruction is not feasible on non-gated scans, we hypothesize that there may be a plausible relationship between coronary plaque volume and onset of symptoms.

Methods Used To identify these plaques before symptom development, an artificial intelligence software using image segmentation techniques [Dense U-net structured] is being built. Once finalized, a retrospective study will be performed at UC Irvine Health on past CT scans to determine if there is a correlation between coronary plaque size and health outcomes. If successful, this tool can be included and ran on all chest CT scans that are performed for indications other than coronary artery disease to evaluate for cardiac health outcomes.

Summary of Results At the time of abstract submission, we are wrapping up the prototype build of our AI. We plan to have results and a fine-tuned neural network by the time of the conference.

Conclusions No conclusions have been drawn at the time of abstract submission. We will discuss the implication of artificial intelligence in medicine, as well as the use of our neural network at the time of the conference.

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ACUTE LIMB ISCHEMIA IN THE PRESENCE OF ATRIAL FIBRILLATION

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Case Report A 53 year old male presents to the emergency department with complaints of non-bloody non-bilious vomiting and abdominal pain for three days. His past medical history is significant for Diabetes Mellitus, hypertension, smoking and recent heavy alcohol use. Physical examination reveals an afebrile man, with sinus tachycardia(106 bpm), normotensive, and tachypneic with respiratory rate in the 30s. Blood glucose was 840 mg/dL with metabolic acidosis and large acetone in urine. He was admitted to ICU and treated for DKA. Next day, on telemetry he developed AF with rapid ventricular rate (RVR). Cardiology was consulted and on subsequent exam lower extremity ischemia was noted. Physical exam revealed left lower extremity was pale, with no palpable popliteal and dorsalis pedis pulses and limb developed poikilothermia. Peripheral embolization causing acute limb ischemia (ALI) was suspected, and was started on heparin infusion with dual antiplatelet treatment. Emboli was confirmed with Doppler Ultrasound. Vascular surgery was consulted. Since our institution is not capable of performing peripheral angiography, patient was scheduled for transfer. However, in less than 12 hours, left foot became viable with improved color and strong pulses. His AF rate was controlled with calcium channel blockers and discharged with Apixaban.

Permanent AF is more likely to cause cerebrovascular event, in our case, new onset AF caused ALI. AF complications typically include renal failure, MI, stroke, infections, and at times death.² In our patient, ALI occurred most likely secondary to AF. Since our patient’s rapid progression of symptoms, the correlation between AF and peripheral disease was challenging. Purpose of this report is to remind physicians to be mindful and consider cardio embolic events in AF, and not be limited by differentials such as CVA. Timely management with anticoagulation, and rate control agents curtailed progression, and complication was resolved.

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351 A GIANT LEFT VENTRICULAR THROMBUS ASSOCIATED WITH APICAL HYPERTROPHIC CARDIOMYOPATHY MIMICKING METASTATIC CANCER

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Case Report To share a rare case with the medical community and evaluate the differential diagnosis, work up and treatment for a left ventricular mass.

Summary A 57-year-old Hispanic female with apical hypertrophic cardiomyopathy (AHCM) and heart failure with preserved ejection fraction presented with acute heart failure exacerbation and 60 lbs weight loss over the past few months. A giant left ventricular (LV) mass measured 4.8×3.4 cm in size occupying one-third of the LV cavity was discovered on transthoracic echocardiogram (TTE). Imaging studies including transesophageal echocardiogram, cardiac CT, and cardiac MRI were inconclusive to identify the etiology of the LV mass. Due to history of weight loss, a complete workup was done to rule out malignant etiology including the whole-body PET scan and left adrenal gland biopsy disproving malignant etiology. Considering the size of LV mass and increased risk of thromboembolic complications, resection of the thrombus was considered. However, the decision was made to medically treat with warfarin and repeat TTE. A repeat TTE after 3-months of therapy with warfarin resulted in near complete resolution of giant LV mass with no complication.

Conclusion Left ventricular thrombus (LVT) is a potential cause of serious life-threatening complications including stroke. It is most commonly a complication of ischemic

cardiomyopathy following a myocardial infarction and occasionally seen in non-ischemic cardiomyopathy. However, it is rarely associated with AHCM. Anticoagulation with warfarin has remained a standard of care with target INR between 2.0 to 3.0. We present a patient with AHCM complicated with a giant LVT which resolved completely after 3 months of warfarin. In the context of complex clinical presentation, a thorough investigation is warranted to rule out malignant and other inflammatory etiologies. Additionally, multidisciplinary approach led to a favorable patient outcome. In the presenting case, anticoagulation therapy with warfarin resulted in a complete resolution of the giant LVT without surgical intervention or thromboembolic complications.

352 EVALUATION OF IN-UTERO ATRIAL SEPTECTOMY IN PATIENTS WITH HYPOPLASTIC LEFT HEART SYNDROME: A REVIEW OF LITERATURE

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Purpose of Study Fetuses with Hypoplastic Left Heart Syndrome and an intact or highly restrictive atrial septum (HLHS-IAS) are a particular subset of HLHS patients with a high perinatal mortality. In-utero atrial septectomy may represent a potential therapeutic intervention for such patients. The objective of this study is to determine whether in-utero atrial septectomy improves overall survival outcomes for patients with HLHS-IAS.

Abstract 352 Table 1 Studies evaluating outcomes of in-utero atrial septectomy in HLHS-IAS

| First Author, Year, Location | Subjects (N) | Procedure Overview | In-utero Procedures | Technically Successful Procedures | Fetal Deaths | Postnatal Procedures AFTER FCI | Discharge Survival |
|------------------------------|--------------|--|---------------------|---|-----------------------------------|--------------------------------|---|
| Vida, 2007, Boston | 32 | In-utero BAS: 9/32 (28%) In-utero AD: 5/32 (16%) No FCI: 18/32 (56%) | 14/32 (44%) | Undisclosed | 0/32 (0%) | 11/14 (79%) | FCI: 11/14 (79%) FCI 6-month survival: 69% non-FCI: 11/18 (61%) non-FCI 6-month survival: 38% |
| Marshall, 2008, Boston | 21 | In-utero BAS: 21/21 (100%) | 21/21 (100%) | 19/21 (90%) | 2/21 (10%) | 19/19 (100%) | 11/21 (52%) |
| Jantzen, 2017, multicenter* | 72 | In-utero BAS: 27/72 (38%) In-utero AS: 20/72 (28%) No FCI: 25/72 (35%) | 47/72 (65%) | BAS: 23/27 (85%) AS: 13/20 (65%) Overall: 36/47 (77%) | BAS: 3/27 (11%) AS: 3/20 (15%) | 34/41 (83%) | FCI: 15/34 (44%) FCI 12-month survival: 59% non-FCI or unsuccessful FCI: 9/27 (33%) non-FCI or unsuccessful FCI 12-month survival: 19% |
| Mackesy, 2017, Philadelphia | 31 | In-utero BAS ± AS: 31/31 (100%) | 31/31 (100%) | 28/31 (90%) | 3/31 (10%) | Not Reported | 7/31 (23%) |
| Kalish, 2014, Boston | 9 | In-utero AS: 9/9 (100%) In-utero BAS post-AS: 4/9 (44%) | 9/9 (100%) | AS: 4/9 (44%) BAS post-AS failure: 2/4 (50%) | 1/9 (11%) | 2/8 (25%) | 4/9 (44%) |
| Pedra, 2013, Brazil | 4 | In-utero BAS: 4/4 (100%) 1 fetus also had AoV | 4/4 (100%) | 4/4 (100%) | 1/4 (25%) | 3/3 (100%) | 0/4 (0%) |

BAS balloon atrial septectomy, AS atrial stent, AD aortic dilation, AoV aortic valvuloplasty, FCI fetal cardiac intervention *This study included the 4 patients in the Pedra study

Methods Used A literature based review was performed through PubMed, Google Scholar, and Medline using key terms such as ‘HLHS,’ ‘highly restrictive OR intact,’ ‘septostomy OR septectomy,’ and ‘fetal OR in-utero.’ Studies published prior to 2000 and those that did not involve in-utero atrial septectomy were excluded.

Summary of Results Six studies matched the inclusion criteria (table 1). The technical success rate of in-utero septectomy ranged from 50% to 90%. Fetal deaths ranged from 0% to 25% and discharge survival rates varied from 0% to 79%. Although not statistically significant, there was a slightly higher discharge survival for the in-utero intervention group in two studies (Jantzen et al, and Vida et al) that compared in-utero vs postnatal treatment. Majority of the studies reported improved neonatal stability at delivery as evidenced by decreased immediate postnatal interventions and neonatal resuscitation.

Conclusions In-utero atrial septectomy as a first line intervention for fetuses with HLHS-IAS is promising. However, large prospective studies are needed to standardize the techniques used, and assess operative outcomes, complications, and long-term survival.

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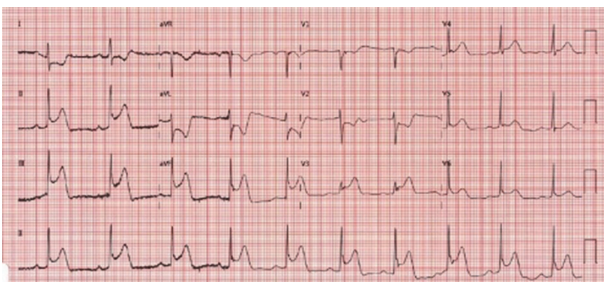
ISOPROTERENOL CAUSING VASOSPASM LEADING TO ST ELEVATION DURING TILT TABLE TEST

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Purpose Inform community about diagnosis, workup and treatment of LVT.

Summary A 48-year-old female presents to clinic for syncopal episodes with a severe burning sensation in her throat radiating to her chest. She underwent tilt table testing for further evaluation. Findings were unremarkable during her initial and exercise phase. During the second stage, isoproterenol was started at 1 mcg/min and increased to 3 and 5 mcg/min. Isoproterenol was increased to 5 mcg/min for 5 minutes and stopped once she reported fatigue. She was then brought to a supine position and within minutes reported 10/10 chest pain. EKG showed ST segment elevations in leads II, III, and aVF (Image). Nitroglycerin, normal saline, and oxygen was given and shortly after she reported relief of her symptoms. She underwent coronary angiogram that showed patent coronary arteries without stenosis. Her echocardiogram was also normal with ejection fraction of 60%. She is currently being treated with calcium channel blockers and long acting nitrate without recurrence of symptoms.



Abstract 353 Figure 1 Recovery stage 1 at 13 sec. ST elevations in leads II, III, aVF, V3. HR 57, BP 77/57

Conclusion Vasovagal syncope is a common and dangerous event many patients often face. It is an autonomic syncope invoked by parasympathetic hyperactivity and/or sympathetic hypoactivity. As a result, patients experience reduced blood pressure and cerebral perfusion. The interest drawn from this study is the concomitant inferior wall STE and severe chest pain responsive to Nitroglycerin. This finding indicates vasospasm of the right coronary artery, which was later validated by a normal coronary angiogram and echocardiogram. It is important to consider this possibility when conducting tilt table testing and to be prepared with nitroglycerin as coronary vasospasm can be fatal.

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INCIDENTAL LEFT ATRIAL MASS FOUND ON ECHOCARDIOGRAM RESEMBLING PAPILLARY FIBROELASTOMA

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Purpose To share an unusual case of a left atrial mass resembling a papillary fibroelastoma based on imaging with the medical community.

Summary A 48-year-old male with history of end stage renal disease and liver cirrhosis presented to the emergency department with shortness of breath. A transesophageal echocardiogram (TEE) revealed a large mobile echo-genic round mass with well defined borders measuring 0.9 cm that appeared to have a homogenous texture attached to a 1.6 cm calcified stalk along the coumadin ridge between the LA appendage and superior pulmonary vein. Other findings from the TEE included severe valvular disease including bicuspid aortic valve and moderate mitral regurgitation. At that time possible differentials included pedunculated myxoma, thrombus or papillary fibroelastoma (PF). However due to the well-defined calcified stalk, round homogenous texture and evidence of underlying valvular disease it was determined that this LA mass most likely represented a PF. Although the patient was offered surgery to remove the mass for a definitive diagnosis, histological identification and to reduce the risk for thromboembolic complications, unfortunately he refused.

Conclusion PF is a rare primary cardiac tumor that usually arises from the valvular endocardium and is rarely found in non-valvular locations. It is estimated that the incidence of primary cardiac tumors is around 0.02% found on post mortem examinations, with PF comprising 10% of cases. The differential for LA masses include thrombus, myxoma, or PF and often can be difficult to differentiate on echocardiogram. Typical echocardiogram findings for PF include (1) round, oval or well-demarcated with homogenous texture, (2) small (<20 mm), (3) many have stalks and those stalks are mobile, (4) may be single or multiple and (5) are often associated with underlying valvular disease. Although PF are usually found incidentally, they are not without possible complications, including cerebral embolization, pulmonary embolus and myocardial infarction. Here we present a rare case of a non-valvular PF that was found on TEE in which the patient never experienced thromboembolic complications.

355 A CASE OF SEVERE PULMONARY HYPERTENSION EXACERBATED BY COMPRESSION OF THE INFERIOR VENA CAVA

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Introduction Pulmonary hypertension (PH) is a disease defined by pulmonary artery pressure (PAP) greater than 20 mmHg. It is accompanied by various pathophysiologic mechanisms including vascular remodeling and hypoxic pulmonary vasoconstriction and classified into five groups based on etiology. Symptoms are typically nonspecific, with most common complaint being dyspnea on exertion, and easily attributable to other conditions.

Case Report A 53-year old Caucasian male with 20-pack year smoking history & HTN presented to our institution for elective hernia repair. During the procedure, the patient was observed to be in atrial fibrillation with fast ventricular response. Post-operatively the patient remained tachycardic and was admitted for further evaluation. History revealed the patient was diagnosed with an 'unknown murmur' and endorsed intermittent episodes of 'fluttering' in his chest. He denied any fatigue, shortness of breath, exertional syncope, chest pain, weight gain, and swelling. Physical exam was unremarkable. A transthoracic echocardiogram was ordered to evaluate for a left atrial appendage thrombus. No thrombus was visualized, instead the patient was found to have moderate tricuspid valve insufficiency with a PAP of 78 mmHg and maximum tricuspid velocity of 4.4 m/s, consistent with severe PH. An extrahepatic cystic structure measuring 6×8 cm was seen compressing the inferior vena cava (IVC). Six-months later patient was seen in clinic. During the visit he reported no new complaints & continued to endorse intermittent fluttering. He denied any exertional syncope, fatigue, dyspnea, chest pain, swelling or weight gain. Repeat Echo continued to show tricuspid insufficiency; however, PAP and maximum velocity had significantly decreased to 34 mmHg and 2.8 m/s, respectively. These findings were consistent with borderline PH. There was no longer any evidence of IVC compression.

Conclusion The patient did not show any symptoms suggesting any underlying disease. The incidental discovery of severe PH with an extra-hepatic mass compressing on the IVC resolved, intriguingly, when followed up. It is unknown how long he had an extra-hepatic mass compressing on the IVC however he carries many comorbidities in which this may have exacerbated his condition.

356 INCIDENTAL FINDING OF CARDIOMEGALY LEADING TO A DIAGNOSIS OF POMPE DISEASE: A CASE REPORT

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10.1136/jim-2021-WRMC.354

Case A 9 month old ex term boy presented to the emergency department with new onset fever and difficulty breathing in the setting of RSV infection, requiring respiratory support. On initial physical exam he was febrile, tachypneic with decreased breath sounds in left lung fields and with gross motor function delay, low muscle tone, absent deep tendon reflexes and large protruding tongue. Cardiac exam with regular rate and

rhythm and normal pulses throughout. A chest X-Ray with significant cardiomegaly prompting evaluation with echocardiogram which showed concentric biventricular hypertrophy with normal segmental anatomy. An ECG showed diffuse increased voltages. Laboratory findings significant for elevated creatine kinase to 647 U/L (24–170 U/L). Findings raised suspicion for Pompe's disease which was confirmed by genetic evaluation. At diagnosis, patient was enrolled in a clinical trial for enzyme replacement with Lumizyme. Upon completion he continued on bi-weekly Lumizyme with normalization of echocardiogram findings and no further evidence of hypertrophy.

Conclusion Cardiomegaly in healthy infants should raise suspicion for work up of an underlying etiology. Genetics evaluation is important early in disease. Pompe disease is an autosomal recessive disorder caused by deficiency of the enzyme lysosomal acid alpha-glucosidase leading to impaired degradation and accumulation of lysosomal glycogen. This accumulation causes lysosome cellular damage and organ dysfunction. Most severe effects are seen in cardiac and skeletal muscle; hypertrophic cardiomyopathy and muscle weakness are common. Clinical presentation varies depending on age of symptom onset. Infantile-onset disease (IOPD) typically presents with non-specific findings often leading to a delay in diagnosis, with most cases diagnosed at later stages hindering effectiveness of therapy. Therapy involves enzyme replacement to allow for degradation of lysosomal glycogen. IOPD is associated with high mortality early in infancy without appropriate treatment. The fortunate outcome for this patient regarding cardiac complications resulted from early intervention. Early diagnosis and prompt enzyme replacement therapy can lead to a good prognosis in patients with IOPD.

357 PERFORMING COLONOSCOPIES IN PATIENTS IN CARDIOGENIC SHOCK AWAITING HEART TRANSPLANTATION: IS IT SAFE?

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Purpose of Study Patients more than 50 years of age routinely undergo screening colonoscopies. These patients can develop severe end-stage heart disease and may require heart transplantation. Many of these patients present in cardiogenic shock and it is unclear whether the use of colonoscopy is safe and efficacious in the screening of these patients for candidacy for heart transplantation. In our single-center program, we perform colonoscopies routinely on all our older patients awaiting heart transplantation. We now report our experience of performing colonoscopies in patients who are in cardiogenic shock, defined as patients who are on intravenous inotropic or left ventricular assist device (LVAD) support to maintain acceptable cardiac hemodynamics.

Methods Used Between 2014 and 2019, we evaluated 300 heart transplant candidates who developed cardiogenic shock, defined as the need for IV inotropes or LVAD support. 30 of these patients underwent colonoscopy while on IV inotropes (n=27) and LVAD (n=3).

Summary of Results Of the 30 patients with inotropic/LVAD support who underwent colonoscopy, the average age was 61.5 years and 87% were male. The specific inotrope(s) administered are listed in the table 1. The following findings

Abstract 357 Table 1

| | Heart Transplant Candidates Undergoing Colonoscopy |
|----------------|--|
| LVAD | 10.0% (3) |
| Dopamine | 80.0% (24) |
| Dobutamine | 70.0% (21) |
| Milrinone | 46.7% (14) |
| Epinephrine | 33.3% (10) |
| Norepinephrine | 43.3% (13) |
| IV Heparin | 3.3% (1) |

at colonoscopy were found: 0 adenomas and 13 benign malignancies. There was no metastatic disease demonstrated. There were no complications arising from this colonoscopy except for bleeding due to biopsies that required hemoclips but no blood transfusions. Inotropic/LVAD support was continued through these procedures.

Conclusions Colonoscopies for evaluation of heart transplant candidates who are in cardiogenic shock are acceptable, but caution should be taken in terms of risk for bleeding. Colonoscopies in cardiogenic shock should be limited to patients who are at risk for colon cancer.

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EVALUATING THE RISK FACTORS ASSOCIATED WITH CORONARY ARTERY CALCIFICATION IN A NORTHERN NEVADA POPULATION

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Purpose of Study To identify the risk factors associated with the development of coronary artery calcification in a large northern Nevada population.

Methods Used This was a retrospective case review that evaluated 1,169 patients who had a computed tomography coronary artery calcium score from January 2017 to September 2018. Coronary artery calcification was calculated by the methods of Agatston et al. Coronary artery calcification and potential risk factors associated with coronary artery calcification were analyzed using a multinomial regression analysis. The risk factors assessed were: hypertension, elevated glucose, family history of coronary artery disease, smoking, BMI, race, and hyperlipidemia.

Summary of Results Following a multinomial regression analysis, the following associations were identified. Age ($p < 0.0001$), male gender ($p < 0.0001$), hypertension ($p < 0.0001$), smoking ($p < 0.0001$), race ($p < 0.0233$), and type 2 diabetes mellitus ($p < 0.0458$) were all associated with the development of coronary artery calcification in this population.

Conclusions The risk factors associated with the development of coronary artery calcification in a population of 1,169 patients in northern Nevada were age, male gender, hypertension, smoking, race and type 2 diabetes mellitus. Hyperlipidemia, BMI and a family history of coronary artery disease were not associated with the development of coronary artery calcification.

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SDKP'S UBIQUITOUS ROLE IN HEALING AND REGENERATION

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10.1136/jim-2021-WRMC.357

Purpose of Study SDKP is a peptide derived from Thymosin $\beta 4$ and hydrolyzed by Angiotensin Converting Enzyme (ACE). Since ACE contributes to the fibrosis and inflammation seen in many cardiovascular diseases, SDKP has been classically studied in this context. The latest research supports that SDKP's anti-fibrotic, anti-inflammatory, and anti-oxidative properties are also applicable to other organ systems. Our goal is to collect from the literature the roles and mechanisms of action of SDKP in healing processes of cardiovascular, kidney, lung, intestinal, neurological, and dermatological diseases to propose an integrated picture of SDKP biochemical properties.

Methods Used A literature review was performed on Pubmed based on recent publications (mostly 2015–2020) exploring SDKP's use in immunologic and highly fibrotic disease models.

Summary of Results SDKP plays a protective role in conditions of hypertension, myocardial infarction, cardiac rupture post-MI, and radiation induced myocardial fibrosis. In the kidneys, researchers found SDKP was not only filtered, but also released from thymosin $\beta 4$ and secreted by epithelial cells lining renal tubules. Lung fibrosis in silicotic mice was attenuated when SDKP levels were increased. SDKP significantly minimized sensorimotor loss, and increased neurogenesis in mice with traumatic brain injuries. SDKP treatment also partially reversed demyelination induced by experimental autoimmune encephalomyelitis. Intestinal bowel disease improved with SDKP's inhibition of pro-inflammatory factor expression in intestinal epithelial cells. Furthermore, SDKP's antifibrotic properties may provide a therapeutic effect in excessive dermal scarring conditions that trigger keloid formation, scleroderma, and hypertrophic scarring.

Conclusions Recent research provides strong evidence that SDKP's inverse relationship with RAS and TGF β -Smad pathways aids control healing in disease states. By taking advantage of SDKP's ability to disrupt these pathways, clinicians may be able to hinder the progression of fibrotic diseases and promote recovery after injury. Future research should investigate the biochemical mechanism(s) supporting SDKP beneficial effects in inflammatory and fibrotic disease models. The expansion of research could lead to SDKP's involvement in novel therapies for a wide range of diseases.

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METHAMPHETAMINE INDUCED CORONARY VASOSPASM

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10.1136/jim-2021-WRMC.358

Purpose of Study To share a rare case of methamphetamine induced coronary artery vasospasm that initially appeared as an NSTEMI.

Methods Used Case report

Summary of Results 41 year old Caucasian female with history of heavy methamphetamine use presented with one day of sudden onset of chest pain after methamphetamine use. Pain was diffuse in nature, 8/10 in severity and subsided on its own. She previously had similar chest pain 3 months ago at which time Dobutamine stress test did not show any signs of ischemia and ejection fraction (EF) was estimated at 60%. During this episode, patient was found to be tachycardic, had elevated troponin of 6.35 ng/ml and EKG showed normal sinus rhythm with new anterior septal Q waves without evidence of ST or T wave changes. Patient was started on acute coronary syndrome protocol for non-ST-segment elevation myocardial infarction. Repeat Transthoracic Echocardiography (TTE) showed EF of 30% along with severe hypokinesis to akinesis at the apex, apical to mid inferior, inferolateral, anterior and lateral walls. She underwent left heart catheterization with angiogram which did not reveal any ischemia. Patient was discharged with carvedilol and lisinopril.

Conclusions The exact mechanisms causing methamphetamine induced cardiac toxicity remain unclear. However, it has been speculated that catecholamine excess with concomitant coronary vasospasm leads to methamphetamine associated cardiomyopathy.¹ Methamphetamine induces vigorous vasoconstriction which potentially results in severe vasospasm of the coronary arteries that can present as angina.² A study of 20 methamphetamine users and 21 age-matched controls showed reduced nitroglycerin-mediated vasodilation in the methamphetamine users, suggestive of smooth muscle dysfunction and reduced nitric oxide sensitivity from methamphetamine.³ Chen reported a 19 year old male with history of methamphetamine abuse who was found to have global slow-flow of all coronary systems in the absence of significant stenosis.⁴ Such dysfunction in the absence of significant stenosis have not been well documented.⁴ With increasing worldwide use of methamphetamine and its cardiotoxic effects, further research on the mechanism of methamphetamine induced vasospasm is warranted. Here, we present a rare case of methamphetamine induced coronary vasospasm.

361 A CASE OF DIABETIC MUSCLE INFARCTION

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10.1136/jim-2021-WRMC.359

Case Report Diabetic Muscle Infarction (DMI) is a rare microvascular complication of diabetes affecting the thigh muscles (80%) and lower leg muscles (17%) with only 170 reported cases. DMI is mostly unilateral but there have been cases of bilateral lower extremity involvement. Patients with DMI have evidence of diabetic retinopathy, neuropathy, and nephropathy at time of diagnosis. DMI often mimics cellulitis, necrotizing fasciitis or deep venous thrombosis leading to misdiagnosis with no clear guidelines for management.

52-year-old Hispanic male with diagnosis of DM, cardiomyopathy with reduced ejection fraction came with right thigh pain, swelling limiting ambulation for 1 month after failure of treatment with oral antibiotics. Physical examination showed erythematous, indurated and tender area 18 cm x 10 cm in right thigh, pitting edema in lower extremity, intact pulses. Patient had no evidence of leukocytosis, however had elevated ESR of 49 mm/hour, CRP 7.98 mg/dl,

creatinine kinase 844 unit/L, Hemoglobin A1c 10.3%. There was no evidence of compartment syndrome, necrotizing fasciitis, muscle weakness. CT of right thigh with contrast showed hypo enhancing severe edema of vastus medialis. Patient was treated with intravenous antibiotics with no improvement. MRI without contrast demonstrated disproportionate enlargement and diffuse heterogeneity of the right vastus medialis muscle with patchy areas of intramuscular hemorrhage, extensive subcutaneous edema, interfascial free fluid, and severe myositis. Patient was discharged with Aspirin for DMI with plan for muscle biopsy at tertiary center, however was delayed due to pandemic. Patient showed gradual clinical improvement in ambulation over course of 8–10 weeks without any further intervention.

DMI is a diagnostic challenge considering clinical presentation similar to skin and soft tissue infection, polymyositis or other vasculitic phenomenon. Recognizing DMI early in course of DM can help prevent major macrovascular complications. MRI is preferred diagnostic imaging. Bed rest, glycemic control and low dose aspirin have helped with clinical improvement in 12 weeks.

362 THE STATE OF THE OBESITY PARADOX IN 2020

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10.1136/jim-2021-WRMC.360

Purpose of Study The detrimental long-term effects of obesity are well-described in literature; however, there has been recently emerging evidence describing a possible mortality benefit in obese patients with acute injury. The scope of this review is to provide an overview of the ongoing debate surrounding this observation. We focused our discussion on evaluating the evidences suggesting an impact of obesity and overweight on multiple acute medical conditions.

Methods Used We searched the PubMed database with the keywords ‘obesity’, ‘paradox’, ‘trauma’, ‘mortality’, ‘BMI’, ‘cancer’, ‘sepsis’, ‘lung injury’, ‘stroke’, ‘COVID’, and ‘myocardial infarct’ from inception to 2020 and selected 40 relevant papers discussing the relationship between mortality and BMI in the setting of these stressors, and the mechanisms behind them.

Summary of Results Amongst the fields of blunt trauma, cardiovascular disease, cancer, and critical care admissions for sepsis and lung injury, there are a growing amount of evidences supporting the existence of a paradoxical mortality benefit with overweight and mild obesity compared to normal and lean BMI. These findings must be attenuated with study design and BMI limitations, as well as biases prevalent throughout these studies. Although several hypotheses have been proposed, the exact mechanisms behind this relationship are largely unknown.

Conclusions This survey of the obesity paradox shows promise in regard to overweight and mild obesity helping with survival post-acute illness, possibly due to metabolic reserves, anti-inflammatory, and anti-oncogenic conditions seen in obesity. We recommend addressing current major limitations by having future studies prospectively designed to evaluate alternative body weight metrics such as waist-to-hip ratio or waist circumference, with special attention to the timing of body weight measurements and its progression in the patient's life.

In the future, elucidating the biological mechanisms of this relationship may allow us to adapt our recommendations to the patients and help direct optimal therapeutic approach in the management of certain acute pathologies.

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PROTECTION FROM THE MEMBRANE ATTACK COMPLEX VIA CD59 UPREGULATION

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Purpose of Study Cerebral amyloid angiopathy (CAA) is a vascular pathology in which smooth muscle tissue is progressively replaced by A β plaques, resulting in a vulnerability to micro/macrohemorrhages. Prior data indicates the membrane attack complex (MAC) plays a role in CAA by inducing vascular cell death. Upregulation of the surface protein CD59 enhances MAC resistance in several cell types. We hypothesize this effect can be recapitulated in primary human cerebrovascular (CV) cells.

Methods Used In a series of preliminary experiments, HEK293 cells were treated with lentiviral vectors carrying either a human CD59 gene and a green fluorescent protein reporter gene (CD59/GFP) or a lone GFP gene (GFP). Untreated HEK293 cells served as controls. CD59 surface expression was measured with flow cytometry. Separately, each cell population was challenged with normal human serum as a source of MAC. The frequencies of intact cells were also measured with flow cytometry. CV cells were isolated from epilepsy brain biopsies, as approved by the Loma Linda University IRB, and treated with a CD59 vector prior to mRNA extraction, quantification, and normalization.

Summary of Results CD59/GFP cells expressed significantly more surface CD59 than the GFP or control cells. No significant difference in surface CD59 was detected between the GFP and control cells. At 90% v/v serum concentration, CD59/GFP cells exhibited a significantly higher frequency of intact cells than the GFP or control cells. Treated CV cells expressed a significantly higher level of CD59 mRNA than untreated CV cells.

Conclusions These preliminary data require confirmation. HEK293 cells were used to test experimental methods prior to the use of CV cells. Increased surface CD59 on CD59/GFP cells suggests that gene insertion was successful, and that vector exposure alone did not affect CD59 expression. CD59 mRNA levels in CV cells may imply a similar outcome. The frequency of intact CD59/GFP cells suggests that upregulated surface CD59 conferred protection against serum content, including MAC. The frequency of intact CV cells and their CD59 surface expression are yet to be assessed.

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EFFECT OF A PALEOLITHIC DIET ON MAXIMUM RIGHT HAND GRIP STRENGTH

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10.1136/jim-2021-WRMC.362

Purpose of Study The paleolithic diet embraces the ancestral hunter-gatherer method of eating: a large consumption of lean

meats, produce, and nuts, and no processed foods. It has gathered momentum in opposition to modern eating practices, which have led to an increase in chronic diseases like obesity and diabetes. However, there is a lack of research on the effect of the paleo diet on grip strength, which is vital in many daily tasks. This study tested whether there was a statistically significant difference in maximal right-hand grip strength between those who follow a paleo diet and those who follow a non-paleo diet.

Methods Used Participants were students from the University of California, Los Angeles who enrolled in LS 23L, a Life Sciences lab course. They completed demographic questions about their habits and diet. Grip strength was tested using a hand dynamometer, where participants sat with their feet flat and back straight, and two seconds of baseline data and eight seconds of maximal grip strength were collected. This study used the maximal grip strength of the right hand. The data was stored in the LS 23L Human Physiology Laboratory Data Base. The two groups selected for this study were those that followed a paleo diet and those that did not. The Welch's two-tailed unpaired T-Test was used to analyze the two groups and a p-value was obtained, which was evaluated at a five percent significance threshold.

Summary of Results The total sample size for this study was n=5057. The first group, those who followed the paleo diet, had a sample size of n=164 and a mean maximal right-hand grip strength of 222 Newtons (N) \pm 85.606 N. The second group, those who followed the non-paleo diet, had a sample size of n=4893 and a mean maximal right-hand grip strength of 202.55 N \pm 81.725 N. The Welch's T-value was 2.89 with a p-value of 0.004346.

Conclusions Based on the p-value, the null hypothesis was rejected, which indicated a statistically significant difference between the two groups. Future studies could test the effects of a paleo diet on maximal grip strength in rheumatoid arthritis patients or athletes who may benefit from increased grip strength. Studies could also explore how the paleo diet enhances grip strength when combined with weight training or exercise. Exploring the impact of different diets may provide a better understanding of how to improve health and holistic treatment options.

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REZUM™ PROSTATE VAPOR ABLATION: STEP BY STEP

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10.1136/jim-2021-WRMC.363

Purpose of Study There are a wide variety of treatment options for symptomatic Benign Prostatic Hyperplasia (BPH). The purpose of this video is to educate health care providers on the technique of treating BPH using the Rezum™ system, a prostate ablation system that uses water vapor therapy. The Rezum™ system delivers water vapor at 103 degrees Celsius into prostate tissue causing cell membrane denaturation and immediate cell death; this eventually decreases obstructive prostate tissue.

Methods Used First, transrectal ultrasound (TRUS) prostate sizing and prostate block with local anesthesia is performed.

To set up the system, turn on the Rezum™ generator and open the delivery device. Use the syringe and spike adapter to draw up the sterile water, ensuring no bubbles enter the syringe. Plug the radio frequency (RF) cable into the

generator. Connect the saline flush device to the generator and spike the saline bag. Then, connect the water syringe to the generator and attach the water tubing with the pressure relief valve pointing downwards. Clamp the drain line, and insert the cystoscope lens through the delivery device.

Prime the delivery device prior to patient contact. Press the white and gray buttons simultaneously then release both once the needle is deployed. Perform one vapor treatment outside the patient by holding the blue button until vapor is released from the needle tip. This removes condensed water from the shaft and activates the idle feature. Retract the needle by pressing the gray button. Connect the light and camera cords to the lens.

Insert the delivery device, and assess the prostate anatomy. Measure the fields of view between the bladder neck and verumontanum to assess the vapor treatment zone. Position the delivery device 1 cm from the bladder neck and deploy the needle (one field of view is 0.5 cm). Activate the vapor treatment while holding the delivery device steady. After each treatment of 9 seconds, retract the needle. Repeat treatments 1 cm apart until the proximal end of the verumontanum is reached. Once lateral lobes are treated, treat the median lobe if present. Inspect the prostate prior to removal of the device. **Summary of Results** By illustrating and standardizing the techniques of the Rezum™ system, provider education is improved.

Conclusions The step-by-step methods described allows efficient implementation of new procedures by the provider and staff.

366 MAGNETIC RESONANCE IMAGING (MRI) FUSION PROSTATE BIOPSY: STEP BY STEP

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10.1136/jim-2021-WRMC.364

Purpose of Study Magnetic resonance imaging (MRI) is being increasingly utilized to help detect and manage localized prostate cancer. Fusion prostate biopsy combines real-time ultrasound (US) with a previously obtained static prostate MRI. This technique has the advantage of MRI targeting while utilizing an US system with which most urologists are familiar. The purpose of this video is to educate health care providers on the techniques of performing an MRI/US-guided fusion biopsy using the UroNav® system.

Methods Used First, a radiologic review of the prostate MRI is performed. The radiologist indicates Prostate Imaging Reporting and Data System (PIRADS) lesions as regions of interest (ROI).

The UroNav® system consists of a radiofrequency generator connected to the exam table and a tracker ElectroMagnetic (EM) chip attached to a standard transrectal US (TRUS) probe. The generator acts as a satellite that detects the location and position of the EM chip on the US probe. The chip is connected to the UroNav® computer where the MRI and US images are fused. The prostate is sized and anesthetized.

Next, the prostate sweep is performed, which is an US image of the prostate from an axial perspective used for fusion with MRI. The UroNav® software on the computer generates a rough outline of the prostate based on the US sweep and the provider adjusts the outline.

The hyperechoic bladder neck, as seen on the sagittal view of the MRI, is used for anatomical orientation. The MRI appears as the purple outline and the US appears in green. The 'blend' feature is used to adjust the image as an US image used for identifying the hyperechoic bladder, or it is used to rotate the MRI and US images for alignment. Once aligned, the images are fused and viewed in real-time.

The first ROI is identified as a target for biopsy. The track of the needle aligns with the red dots as seen on the UroNav screen. Looking at the various views of the prostate also helps to align the biopsy needle in 3D view when performing the biopsy.

After the targeted lesion biopsies are completed, a standard template TRUS biopsy can be performed.

Summary of Results By illustrating and standardizing the techniques of the UroNav® system, provider education is improved.

Conclusions The step-by-step methods described allows efficient implementation of new procedures in the clinic by the provider and staff.

367 DEVELOPMENT OF AN OSTEOPATHIC STUDENT RESEARCH JOURNAL

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Purpose of Study A survey of first-year osteopathic medical students (>800) found that they viewed research as valuable and beneficial to their future careers. Osteopathic and allopathic students have seen an increase in the average number of research experiences and deliverables for matching seniors. This recent data indicates that research is an essential component of the student and trainee experience. To help medical students fulfill these goals, a team of eight 3rd year medical students created a medical student research journal focused on giving students an opportunity to showcase their research findings in a peer-reviewed journal.

Methods Used Expert peer reviewers with either clinical or biomedical backgrounds (n=32) were recruited. Articles submitted by medical students underwent initial review by the Editor in Chief or Managing Editor for adherence to the author guidelines before they were sent to a Section Editor. Section Editors were responsible for selecting reviewers and ensuring that the review process was done blindly between the authors and reviewers. Peer Reviewers were required to review the manuscript and determine if the article was suitable for publication or required revision. Peer Reviewers from the same institutions as the author were not allowed to review the submitted article to avoid potential conflict of interest.

Summary of Results Students submitted 15 articles for consideration in the inaugural issue. Articles were submitted from 3 different colleges in 3 different states. Currently, 3 articles have gone completely through the peer review process and have been approved for publication, 1 has been rejected, and the remaining articles are at different stages of revision. The average number of revisions for each article that was accepted for publication is two and the time from submission to publication is ~ 2 months.

Conclusions We created a student-run medical research journal for students that follows the guidelines of the International Committee of Medical Journal Editors. This endeavor will

increase opportunities for osteopathic medical students to build critical analytical, communication, and leadership skills. As the journal grows and more submissions are received, further research will be required to determine the impact of this journal on medical students and the medical education community.

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RETINA SPECIALITY CLINIC FOR THE UNDERSERVED IN UTAH

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Purpose of Study In 2019, our team created a free retina specialty clinic to provide treatment for underinsured patients. We noted a patient population unable to afford ongoing treatments for retinal diseases such as exudative macular degeneration (AMD) and diabetic retinopathy (DR). These diseases, left untreated, result in irreversible vision loss and possible blindness. Lack of insurance and inability to miss work were the two major factors resulting in vision loss. Visual impairment severely impacts a person's daily life. Our goal is to prevent this by providing medical care to maintain patient independence.

Methods Used Patients are referred from general ophthalmologists and optometrists. Patients with no medical insurance who are unable to afford ongoing treatments and unable to obtain financial support through government programs are enrolled in our free clinic. Services provided include exams and treatment for AMD and DR. Treatment includes intraocular and periocular injections, surgery, panretinal photocoagulation (PRP) and focal lasers.

Costs to run the clinic are donated by the physician group. Samples of medications are donated by pharmaceutical companies while other low-cost supplies are provided by the clinic. The volunteer staff has included participation from 2 retina surgeons and 9 ophthalmic technicians. The clinic has been held 1–2 times per month on Sunday, as many patients and their family members cannot afford to miss work the other days of the week.

Summary of Results From June 2019 to August 2020, 223 patient visits were recorded. 130 injections, 4 surgeries, 10 PRP and focal lasers were used to treat retinal diseases. Volunteer hours contributed to the clinic is 100 hours. Clinic patients received free medical treatment saving them in total \$178–\$1,693 per visit. Surgical patients saved on average \$1,628 per case.

Conclusions We successfully created a free clinic to offer treatment for retinal disorders in low-income populations. In the future, we hope to increase the total number of patients served, services provided, and reduce the number of people with untreated retinal diseases. Further research is indicated to determine the impact this clinic has had on treating retinal diseases in low income populations.

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DEVELOPING A RURAL HARM REDUCTION NETWORK ACROSS THE ALASKAN KENAI PENINSULA

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Purpose of Study Throughout America's ongoing opioid epidemic, rural communities have been especially impacted. Small towns have limited resources and are often unable to support organizations dedicated to drug use. However, innovative health intervention techniques could be particularly well-suited to rural areas. This study examines peer-to-peer interventions to reduce the harm of IV drug use on the Alaskan Kenai Peninsula, a large and sparsely-populated landmass on the state's southcentral coastline.

Methods Used Information for this project was gathered in the context of a clinical immersion in Homer, Alaska, a rural healthcare hub on the Peninsula. The author used an asset-based approach that involved interviews with patients and clinicians to identify existing community resources, including nonprofit organizations and cultural values/strengths. After resources were identified, a literature review was conducted to explore interventions that could build upon the region's existing assets.

Summary of Results Public health data suggested a high rate of Alaskan opioid overdose deaths and complications related to IV drug use. Interviewees point out existing resources such as a syringe exchange program in Homer that employs a harm reduction approach by providing clients with free sterile injection supplies. They also describe a culture of communal support throughout the Peninsula. Physicians acknowledge transport as a major issue: opioid use disorder is prevalent in the many small towns and villages in the region but due to their distance from Homer, residents lack access to harm reduction services.

During the literature review phase, emerging research suggested that peer-to-peer distribution of sterile syringes is a common practice among clients of syringe exchange programs. For example, The Homer Syringe Exchange already partners with two clients to formally distribute syringes to peers who lack transport to Homer. Other studies have showcased 'peer intervention trainings' that empower people who use IV drugs to help their peers inject more safely and prevent overdose.

Conclusions The author proposes that a hybrid model of peer intervention training and peer syringe distribution could make harm reduction services more accessible throughout rural regions. On the Kenai Peninsula, a 'hub-and-spoke' peer distribution network based out of Homer may be feasible.

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COMMUNITY-BASED STRATEGIES TO IMPROVE MENTAL HEALTH AND WELL-BEING OF OPIATE USERS IN KING COUNTY, WA

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Purpose of Study The Shoreline International Community Health Services (ICHHS) clinic is located in North Seattle, which has a population of nearly 45,000 people. Many providers at the clinic view opiate use disorder as a prominent public health issue impacting the Shoreline community. Opiate deaths accounted for 75% of drug-related deaths between 1997–2015 in King County with most of the deaths being concentrated in Seattle. An asset-based approach was utilized to find community organizations within Shoreline that are actively working to treat opiate-dependent users.

Methods Used Shoreline ICHS works closely with Therapeutic Health Services (THS), which is a methadone treatment clinic who's mission is to treat individuals experiencing chemical dependency and mental illnesses to improve quality of life. A literature review was conducted to investigate how community assets like THS can improve current mental health counseling interventions for opiate-dependent users in order to decrease drug dependency.

Summary of Results Many studies have shown the benefits of incorporating family therapy for adolescent drug users. One study found that youth who received family therapy used significantly fewer drugs compared to youth receiving group therapy. Other studies looked at family therapy in adult drug users. One randomized trial found that family therapy correlated with a greater number of drug-free clients compared to the low-contact and standard treatment groups who did not work with therapists trained in family therapy. In addition, another study found that acceptance and commitment group therapy (ACT), focused on mindfulness, significantly improved clients' psychological well-being relative to the 12-steps narcotics anonymous (NA) therapy and standard methadone treatment.

Conclusions This literature review aimed to build upon already existing programs and clinic ties to improve the well-being and mental health of opiate users. Results are in the progress of being shared with THS. Expanding THS's current family therapy model for all opiate-dependent users and supplementing current group therapy with acceptance and commitment therapy could prove beneficial in improving the mental health of clients.

371 AT-PHARMACY TRANSLATION TO INCREASE UTILIZATION OF TRANSLATION SERVICES BY LIMITED ENGLISH PROFICIENCY POPULATIONS IN KING COUNTY, WA

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Purpose of Study Over 27% of King County, WA residents do not speak English at home, and over 10% speak English less than 'very well.' Two pharmacies in King County offer translation in Somali and Vietnamese, comprising 13% of languages spoken by the county's Limited English Proficiency (LEP) population. Providers report higher rates of correcting medication misunderstandings with LEP populations at subsequent visits than with non-LEP populations. Importantly, LEP patients with same-language physicians still report decreased medication understanding and adherence, potentially indicating a role for pharmacy-level translation. This asset-based study examines the role pharmacy-level translation may play in increasing LEP access to medication translation services.

Methods Used This study employed an asset-based approach to understand community-level concerns with LEP pharmacy services, and to assess what interventions they support. Clinical observations and a patient interview were conducted. One pharmacy providing translation services was interviewed. A literature review was conducted to understand what interventions have been implemented in other communities.

Summary of Results Only two states, NY in 2012 and CA in 2016, have implemented mandatory translation services at commercial pharmacies. NY's law showed meaningful increases

in pharmacy capacity to provide translation after implementation. Daily use of translated printed labels and oral interpretation services by LEP patients increased dramatically, nearly quadrupling after implementation.

Conclusions An asset-based approach allows a hyperlocal understanding of community capacity and unmet need for language-congruent pharmacy services. Demographically, King County's growing LEP population makes it a good candidate for pharmacy translation services. Initial data from the NY law indicates demand for services and feasibility of implementation. WA Association of Family Physicians (WAFP) has endorsed a state mandate (2020). Next steps include writing a letter to the WA Office of Insurance Commissioner recommending implementation. There is a need for studies assessing CA and NY pharmacy laws and their impacts on medication comprehension and adherence in LEP populations.

372 FACTORS AND INTERVENTIONS ASSOCIATED WITH UNCONTROLLED PAIN IN HIDRADENITIS SUPPURATIVA

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Purpose of Study Hidradenitis Suppurativa (HS) is characterized by recurrent painful nodules and abscesses. Pain is considered to be the most important HS symptom. We evaluated the influence of demographic factors and pain management therapies on pain control in HS.

Methods Used Facebook HS support groups received an anonymous online survey. Participants were asked 'Do you feel your pain from HS is under control?' (yes=controlled; no=uncontrolled). Participants selected all pain interventions they have tried for HS pain from a list of 20. Baseline pain was assessed using a rating scale (0–10). Multivariate logistic regression models adjusted for Hurley stage (significance $p < 0.05$). 95% confidence intervals accompany odds ratios (OR).

Summary of Results 93.8% of the 438 participants were female. Pain was controlled in 29.2% and uncontrolled in 70.8% which included 52.8% (19/36) of participants with Hurley stage I (mild), 66.7% (156/234) of stage II (moderate), and 80.4% (135/168) of stage III (severe). Uncontrolled pain was more common in those without compared to those with a first-degree relative with HS (75.9% vs 64.0%; OR=1.77 [1.08–2.89]; $p=0.02$). Mean baseline pain was higher with uncontrolled than controlled pain (4.2 vs 2.5; OR=1.23 [1.13–1.35]; $p < 0.01$).

Users of the following therapies were significantly more likely to report uncontrolled pain than nonusers: **topical cannabidiol (CBD)** (85.3% vs 68.1%; OR=2.63 [1.33–5.70]; $p=0.01$), **oral CBD** (82.4% vs 67.7%; OR=2.31 [1.30–4.30]; $p=0.01$), **CBD baths** (96.0% vs 69.2%; OR=10.47 [2.13–189.65]; $p=0.02$), **gabapentin** (93.0% vs 68.4%; OR=5.16 [1.79–21.86]; $p=0.01$), **cold compresses** (76.9% vs 65.7%; OR=1.74 [1.13–2.69]; $p=0.01$), **marijuana smoking** (78.9% vs 67.4%; OR=1.77 [1.09–2.94]; $p=0.02$), **marijuana edibles** (81.3% vs 68.0%; OR=1.91 [1.09–3.51]; $p=0.03$), and **alcohol** (84.1% vs 68.3%; OR=2.48 [1.29–5.18]; $p=0.01$).

Conclusions A history of pain interventions used for HS may be an indicator of overall pain control. Pain management

recommendations should be incorporated into HS treatment plans.

373 EVALUATING MEDICATION ADHERENCE IN DERMATOLOGY DURING VIRTUAL VISITS

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Purpose of Study Assessing treatment adherence has traditionally relied on patient reports during in-person visits. With the evolution of telemedicine, these assessments must be conducted virtually. Here we highlight several evidence-based methods for quickly evaluating medication adherence during virtual dermatology visits.

Methods Used ‘Medication adherence dermatology’ was searched in PubMed on September 7, 2020 which yielded 437 results. After sorting by best match, authors screened the manuscripts and references of the first 10 results and selected methods of assessing medication adherence suitable for use during virtual visits.

Summary of Results Selected methods of evaluating medication adherence during virtual visits included the Morisky Medication Adherence Scale with four items (MMAS-4), the Dermatologist-directed Questionnaire (DDQ), and smartphone apps. The MMAS-4 queries whether a patient (1) ever forgot to take their medication, (2) is careless about taking medicine, (3) stops taking medicine when they feel better, and (4) stops taking the medicine when they feel worse. ‘No’ responses to all four questions indicate the highest level of adherence. The simplicity of the MMAS-4 questions and scoring make this an ideal tool for web-based use in patients with regularly prescribed medications, although it may have limited utility with topical PRN agents. The DDQ includes four questions for topical therapy and four for oral medications. High importance is placed on treatment effectiveness in the DDQ, as lack of efficacy may lead to poor adherence. Many smartphone apps generate a report of medication adherence; some also allow users to track symptoms along with medication usage which can be submitted via patient portals. These reports facilitate a side-by-side review of symptom changes with concurrent medication usage. This method may be ideal for patients using PRN agents.

Conclusions Time spent in virtual waiting rooms can be leveraged for administering questionnaires on medication adherence. Incorporating the strategies discussed above into virtual visits can serve to enhance the quality of care delivered via telemedicine.

374 LINKAGE TO LGBTQ+ HIV/STD CARE: FROM COMPETENT SCREENING TO TREATMENT

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10.1136/jim-2021-WRMC.372

Purpose of Study The LGBTQ+ community faces multiple health disparities, including greater STD and HIV infections, due to stigma, access to care, and competency in healthcare providers. Healthcare providers’ awareness of individual sex behavior plays a large part in HIV/STD screening and care in the LGBTQ+ community. Capitol Hill is the historically

LGBTQ+ neighborhood in Seattle Washington with many resources and events targeted at the LGBTQ+ population. **The purpose of this review** was to utilize an asset-based approach to investigate interventions aimed at linking STD/HIV-positive LGBTQ+ patients to competent and timely treatment to reduce both STD rates and transmission within the community.

Methods Used An asset-based approach was used to identify the strengths and resources present in the Capitol Hill neighborhood. Community assets and public health concerns were identified through conversations with clinicians, patients, and leadership at local organizations. After synthesizing the assets and public health concerns, a review of the literature on linkage-to-care interventions was conducted.

Summary of Results Community conversations with providers and patients elicited concern for STDs rates among LGBTQ+ individuals and the need for competent non-stigmatizing treatment. Research on community stakeholders revealed that Capitol Hill is a neighborhood rich with resources for LGBTQ people seeking screening for STDs, though lacked the ease of access to prompt and LGBTQ+ competent treatment. Community Based Organizations (CBOs) included U-Test, Entre Hermanos, Lifelong AIDS alliance, and Gay City, which offer culturally competent HIV/STD testing for members of the local community. The literature review revealed that the use of LTC (linkage-to-care) coordinators at LGBTQ+ friendly STD/HIV screening sites resulted in a significant reduction of time between HIV diagnosis and treatment among several LGBTQ+ populations. Weaknesses of this approach include the difficulty in funding the LTC coordinator.

Conclusions Although no LTC interventions were identified in Capitol Hill, Capitol Hill has the necessary infrastructure to create these interventions through the wealth of culturally competent CBOs. Funding LTC coordinators may ultimately reduce costs associated with treatment as well as reduce STD/HIV rates in Seattle Washington, particularly among LGBTQ individuals.

375 ASSET-BASED APPROACH TO ADDRESSING ALCOHOL USE IN SUNDANCE, WYOMING

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Purpose of Study Sundance, WY is a town of 1,252 people in Crook County that has high rates of alcohol use and alcohol-impaired driving deaths. Community members and organizations have worked toward addressing alcohol use in Sundance yet continue to recognize heavy alcohol use as a significant concern within the community, identifying it as a harmful cultural norm that is largely undiscussed.

Methods Used To determine community engagement in addressing alcohol use in the county, an asset-based approach was used to assess the community’s strengths and current interventions and to assess the best method of addressing alcohol use among the residents. Representatives from the Be Well Coalition and Crook County Public Health and clinicians and patients from Sundance Clinic were interviewed. Literature reviews and local public health reports also were evaluated.

Summary of Results The interviewees reported that ‘everything is around drinking’ in the community and heavy alcohol use

is a cultural norm, due in part to the accessibility of alcohol in town and the lack of conversation regarding heavy alcohol use and binge drinking in Crook County. Public health reports showed that Crook County has a 68.67% prevalence proportion for alcohol use as a risk factor for mortality, a 27.16% prevalence proportion for binge drinking, a 15.37% prevalence proportion for heavy drinking, and a 43% rate of alcohol-impaired driving deaths, all above the state's average percentages for these risk factors. The Be Well Coalition has implemented several programs aimed at reducing underage drinking, including Training for Intervention ProcedureS (TIPS) for bartenders and an event planning kit rental program. Crook County Public Health was in the process of launching a media campaign to address alcohol use in older populations.

Conclusions Through using an asset-based approach to public health, a community's strengths can be readily identified and capitalized upon. This method promotes collaboration within the community to work toward its best interests, which can be seen through Sundance organizations working together to address alcohol use within the county. Next steps include involving Sundance Clinic in increasing discourse regarding alcohol use among the community residents. A future intervention to explore is the implementation of alcohol use screening forms and brief interventions at Sundance Clinic.

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RACIAL AND ETHNIC DISPARITIES IN THE USE OF LIVE VIDEO TELEMEDICINE

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Purpose of Study As a result of the coronavirus disease 2019 (COVID-19) pandemic and physical distancing, telehealth has been scaled up as a key strategy to address the need for virtual access to medical services. Previous studies have examined use of web-portals for accessing health information, but data on the use of live video telemedicine for disease management across different ethnicities is limited. The objective of this study is to determine if disparities exist among different ethnic groups in accessing live video telemedicine services.

Methods Used A literature review was conducted using databases such as PubMed and Google Scholar. Key search terms included: telehealth, telemedicine, ethnicity, and disparities. Studies were included if a) they were conducted in the United States, b) patients used a live video telehealth service with a provider, c) focused on telemedicine use across different racial and ethnic groups, and d) investigated completed access to live video telemedicine at the individual level, and not potential access at the aggregate level.

Summary of Results Of 25 articles found, 5 met our inclusion criteria. Overall, white patients had higher rates of telehealth visit completion and video telehealth use than non-white patients. Studies that used telehealth visits for diabetes education and glycemic control showed that self-care improved in all ethnic groups, but despite tailored intervention, minority groups never achieved the same level of self-care as whites.

Conclusions Our review suggests that overall white patients have better access to live video telemedicine, and use the services at higher rates compared to non-white patients. However, since this trend was not seen in every study, it is likely that other factors beyond race and ethnicity play a role in access to telemedicine. Effective strategies are needed to mitigate disparities to ensure equitable telemedicine access.

Abstract 376 Table 1 Use of live video telemedicine according to racial and ethnic identity

| First author, Year, Location | Patients (N) | Race/Ethnicity (% each group) | Type of telehealth and specific illness | Outcomes |
|------------------------------|--|---|---|--|
| Wood, 2020, Pennsylvania | Telehealth visits N=331 | 20% African American 62% White 2% Asian and Pacific Islander 15% Other | Video telemedicine for adolescent medicine encounters during COVID-19 pandemic | Completion of Telehealth visit, white vs. non-white: 89.7% vs. 78.0, p=0.003 |
| Weinstock, 2011, New York | TeleMed group N=844, Standard care group N=821 | 50% White; 35% Hispanic; 15% Black | Video telemedicine diabetes education intervention with target HgBA1C <7% | Over 5 years: The average A1C levels dropped significantly compared to baseline for all ethnic groups. For Hispanics the average A1C remained above 7.0 after 5 years of intervention |
| Abel, 2018 | 2.17 million veterans with one or more mental health diagnoses | 77.7% White 18.59% African American 0.65% Latino | Use of Web-Based My Health Vet (MHV) records and clinical video telehealth (CVT) by veterans for mental health visits | MHV use Odds Ratio compared to whites: African American=0.51 CI(0.48–0.54), Latino=0.53 CI (0.46–0.62), CVT use Odds Ratio compared to whites: African American=0.72 CI (0.62–0.85), Latino=0.88 CI (0.79–0.98) |
| Trief, 2018, New York | N=1665 | 49% White 35% Hispanic 15% Black | Televideo educator visits (every 4–6 weeks) for diabetes control | Adjusted mean% days spent on self-care activities for year 5 of intervention: Whites vs Blacks vs Hispanics: 34% vs 30% vs 29% |
| Park, 2018 | N=22294 | 67% White 15.5% Hispanic 13.3% Black 13% Multiple Races | Video telemedicine for mental or physical health | Live video communication was higher for non-white (22.7%–38%) and Hispanic (24.8%) populations compared to whites (14.6%). Respondents in rural areas were less likely to use live video communication (OR: 0.778), compared to urban or suburban respondents. |

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EFFECTIVENESS OF EDUCATIONAL INTERVENTION METHODS TO ADDRESS THE DISPARITIES IN ASTHMA CARE IN UNDERSERVED PEDIATRIC POPULATIONS

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Purpose of Study Asthma in underserved pediatric populations has been associated with higher morbidity and mortality. The purpose of the study is to determine the effectiveness of asthma education interventions in reducing the disparities in pediatric asthma outcomes.

Methods Used A literature review was conducted through PubMed, Google Scholar, and Sci-Hub databases using keywords: 'disparity', 'asthma', 'education', 'pediatric', 'underserved population', and 'minority'. Only prospective randomized controlled trials of pediatric asthma in underserved populations that used an outpatient intervention were included in our literature review.

Summary of Results A total of 6 studies matched the inclusion criteria (table 1 below). The most common outcomes assessed include the number of emergency room visits, hospitalizations, patient quality of life and disease management. Majority of the studies showed a significant decrease in the percentage of ED visits and hospitalizations in the intervention groups, as

well as improved quality of life and disease management due to asthma education. Intervention methods varied from a general educational session to a more individualized approach. The tailored interventions seemed to have the greatest improvement, with high reductions from 13.7% to 3.9% in hospitalizations and 40.2% to 9.8% in ED visits post intervention. Asthma severity and other confounding variables, such as parental factors were not taken into account in all of the studies.

Conclusions Our literature review suggests that individualized asthma education interventions are very effective in improving the health outcomes of underserved pediatric patients with asthma. Larger studies that take into account caregiver factors and asthma severity are needed to design more targeted interventions.

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PHYSICIAN-PERCEIVED BARRIERS TO USE OF STANDING ORDER FOR INFLUENZA VACCINATION

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Abstract 377 Table 1 Interventional studies for management of asthma among different ethnic groups

| Author Last Name, Publication year, Location | Population N, Age range | Ethnic groups % | Intervention and Control Definition, N (%) | Definition of Outcomes Measured | Outcomes Measured Intervention vs. Control |
|--|-------------------------|---|--|---|--|
| Karnick et al, 2004, Illinois | N= 212, 1–16 yrs | Black 66.4%, Hispanic 33%, Other 0.33% | Group 1: One session of Education, N=74 (34.9%), Group 2: Education and monthly phone calls, N=68 (32.1%), Group 3: Education, Case management to resolve problems, N=70 (33%) | 1) # of hospitalizations 2) # clinic visits 3) # emergency visits | Compared to baseline, for all 3 groups, there was an average decrease of 81% in hospitalization, 64% in emergency visits, 58% in clinic visits. Comparing the 3 groups post intervention, only significant decline was in clinic visit: Group 1 vs Group 2 vs Group 3: 45% vs. 49% vs 79% (p<0.0001) |
| Agusala et. Al, 2018, Rural Texas | N=102, 2–18 yrs | Hispanic (6.9%), White (70.6%), Black (7.8%), Other (14.7%) | Intervention: Intense education sessions with patient and caregiver, N=102 (100%), Control defined as before intervention, N=102 (100%) | 1) # of hospitalizations 2) # of ED visits | Hospitalization : Pre-Intervention: 14 (13.7%) vs Post-Intervention: 4 (3.9%) p=0.014, ED Visits: Pre-Intervention:41 (40.2%) vs Post-Intervention: 10 (9.8%) p<0.001 |
| Valery et. al, 2010, Australia | N= 88, 1–17 yrs | Indigenous Australian (98%), Other (2%) | Intervention: 3 additional education sessions at 1, 3, 6 months, 35 (40%), Control: Standard education, 53 (60%) | 1) # of unscheduled hospital visits/ED visits 2) # of missed school days | Both groups had significant decrease in #unscheduled hospital or ED visits but comparing the 2 groups 100% had at least one visit to the ED or Hospital. #Missed school > 7 days: Intervention: 21% vs. Control 100%, p<0.05 |
| Flores et. al, 2009, Wisconsin | N=220, 2–18 yrs | African American 81.4%, Hispanic 18.6% | Intervention: Monthly asthma education by parent mentors for families with children with asthma at community sites and/or home visits, High Participants participated in >50% of activities, N=112 (51%). Control: standard education, N=108 (49%) | 1) # of ED visits 2) % decrease in asthma hospitalizations | % Reduction in ED Visits; High Participants: 85.7% vs Control: 33.3% (p |
| Nelson et. al, 2011, Missouri | N=241, 2–10 yrs | African American 94.6%, White 1.7% | Intervention: Flexible schedule of asthma coaching for caregivers over 18 months, N= 120 (50%), Control: No coaching session, N=121 (50%) | 1) # of hospitalized children 2) # of PCP visits 3) # of ED visits | Hospitalization (# of children): Intervention (endpoint): 24.2% vs Control(endpoint): 26.4% (P=NS) PCP visits: Intervention(endpoint):27 (22.5%) vs Control(endpoint): 17 (14%) p |
| Bonner et. al, 2002, New York | N=119, 4–19 yrs | Latino 73.1%, African American 22.7%, Other 4.2% | Intervention: A family coordinator performed multidimensional individualized asthma education and facilitated doctor-patient interactions, N=56 (47%), Control: Standard education, N=63 (53%) | 1) Activity restriction 2) % of symptom persistence 3) % of adherence to use of inhaled medication at follow-up | Activity restriction: Intervention: 20% reduction vs Control: 2% increase p<0.01 |

Abstract 378 Table 1 Physician-perceived barriers to use of standing order for influenza vaccination

| First Author, Year, Location | Study Methods & Subjects | Barriers Identified & Comparison Rates (Non-Users v. Users) | P Value |
|------------------------------|---|---|-----------|
| Cataldi, 2020, Colorado | Survey of 471 Pediatricians | 1) Patients preference to speak with physician prior to vaccine (62% v 24%) 2) Belief that physician should be the one to recommend a vaccine to patient (57% v. 19%) 3) Patient may receive the wrong vaccine (68% v. 20%) | P < 0.001 |
| Cataldi, 2019, National | Survey of 623 FM & IM Physicians | Physician's belief in their self-efficacy to change a patient's mind on vaccination (72% low self-efficiency v 80% high self-efficiency) | P = 0.08 |
| Albert, 2012, National | Survey of 880 FM & IM Physicians | 1) Awareness of ACIP recommendations and/or Medicare regulations (41.4% v. 61.1%) 2) Belief that SOPs enhance adult vaccination rates (60.2% v. 79.4%) 3) Clinical support, physician helpers (46.3% v. 56.3%) | P < 0.001 |
| Zimmerman, 2011, National | Survey of 1517 FM & IM Physicians | 1) Awareness of ACIP recommendation to use SOP (35.8% v. 70.9%) 2) Agreement with the effectiveness of SOP use (50.6% v. 81.4%) | P < 0.001 |
| Barnard, 2016, Colorado | Interview with 39 staff members at 6 OB-Gyn Practices | 1) Competing demands of the practice at the level of both staff and providers 2) Patients preference to discuss vaccine information with medical providers | N/A |

FM = Family Medicine, IM = Internal Medicine, SOP = Standing Order Practice

Purpose of Study Influenza vaccine coverage remains less than ideal across the nation. The objective of this study is to determine barriers to use of standing orders for influenza vaccination from a physician perspective.

Methods Used A comprehensive literature search was utilized through multiple search engines, such as PubMed, Google Scholar, Medline using key words, 'standing orders', 'influenza', 'beliefs', 'attitudes', and 'barriers'. Only studies published after 2000, in the United States that focused on use of standing orders for influenza vaccine in outpatient settings were included.

Summary of Results We found 5 studies that matched our inclusion criteria (See table 1). Consistent use of standing orders for influenza ranged between 19.9% and 80% in those which reported its use. The survey questions varied among different studies but common themes emerged for those practices that were less likely to use standing orders for influenza vaccine. The themes included: a) lack of awareness about the Advisory Committee on Immunization Practices (ACIP) recommendation in regards to standing order for influenza vaccine, 2) preference to speak or check with the physician directly prior to the vaccine, 3) inadequate clinical or staff support level, and 4) lack of belief that standing orders will increase vaccination rates.

Conclusions The use of standing orders for influenza vaccine still remains suboptimal across different practices. Further efforts aiming at addressing the clinicians' and patients' concerns are needed to promote the use of standing orders.

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THE IMPACT OF SB-159 ON THE PROVISION OF HIV PRE- AND POST- EXPOSURE PROPHYLAXIS IN SACRAMENTO, CALIFORNIA

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Purpose of Study The passing of SB-159 in the State of California shows great promise in the prevention of HIV and improvement in the lives of HIV infected individuals and their partners. The new law allows pharmacists with board approved training to initiate and dispense pre- and post-

exposure prophylaxis for HIV (PrEP and PEP) directly to patients without the need for a prescription from a physician. HIV PrEP and PEP are drug regimens utilized by HIV-negative high-risk individuals to protect against the contraction of HIV. The goal of our research project is to study the implementation of SB-159 in pharmacies located in the Sacramento area. With the implementation of SB-159, patients will have easier access to PrEP and PEP and reduce their risk of morbidity. This research aims to explore the plans of action of pharmacies in Sacramento and El Dorado counties for providing the most efficient and effective prophylactic care for HIV, in line with their newly assigned responsibilities per SB-159.

Methods Used Telephone surveys with a random sample of Sacramento pharmacies will be conducted starting in August 2020. Fifty to seventy five pharmacies will be selected randomly from zip codes and will include retail, clinic and hospital pharmacies in Sacramento and El Dorado County. Data analysis will be conducted with Microsoft Excel to generate summary statistics and identify the number of Sacramento and El Dorado county pharmacies providing PrEP and their plans for stocking and completing the board approved training to furnish PEP and PrEP.

Summary of Results This is an ongoing research project currently in the data collection phase. Results are not available at this time. Data collection is taking place over the next few months and results will be available in time for the presentation.

Conclusions Based on the results the study, we hope to gain insight into institutional efforts for training pharmacists, their willingness to be trained and to furnish HIV prophylaxis, and their plan of action (i.e. education on federal regulations associated with determining and educating patients that meet the criteria for prophylaxis). This information can be utilized to analyze the impact of laws like SB-159 and their broader role in preventative healthcare.

380

HOME HEALTH ACCESS IN RURAL FERRY COUNTY WASHINGTON: BARRIERS AND SOLUTIONS

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Purpose of Study The aging population of Ferry County Washington is part of the only 2% of national Medicare beneficiaries to whom no home health services are available. This is of special concern for this community as it has an over-65 population that is nearly twice the national average. This project sought to identify barriers to home health provision in the frontier community of Ferry County, WA, and to suggest a possible path towards developing such services.

Methods Used Using an asset-based framework, stakeholders who had an interest in home health provision in Ferry County and resources with experience in rural home health provision were identified. Interviews were conducted with these groups to gain perspective on the existing barriers to and possible solutions for the provision of home health services in Ferry County. A review of existing research and public policy papers offered an expanded understanding of the need for, barriers to, and feasible methods for expanding home health access in rural communities.

Summary of Results Guidance from the Washington State Office of Rural Health Director and research of the home health provision barriers that most affect Ferry County illuminated a plausible path forward for bringing some in-home health services to the area. The identified path uses a Center for Medicare and Medicaid Services (CMS) Home Health Agency Shortage Area declaration to allow Ferry County Health to provide in-home nursing visits through their Rural Health Clinic. Though this is not a complete solution to the lack of home health services in Ferry County, it is a viable first step in addressing the need for such services.

Conclusions Using an asset-based framework helped identify the possibility of incorporating home health into the services of the already present and community-oriented Ferry County Health. This is in keeping with research that suggests that services such as home health are best optimized when well-coordinated with existing services in the area. The next steps for Ferry County Health will be working with the state Rural Health Director, Department of Health, and CMS to get a shortage area declaration approved with specific parameters for what services will be allowed under the declaration.

381 ASSET-BASED APPROACH TO ADDRESSING SKIN CANCER PREVENTION IN POWELL, WYOMING

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Purpose of Study Powell, WY has a population of 6,180 residents that are 91.6% White and 17.6% aged 65 years and older. Powell's major industries include Agriculture, Mining, and Oil/Gas Extraction in which workers spend extended periods of time outdoors in direct sunlight. Through conversations with community members and analyzing Powell Valley Healthcare's (PVHC) annual public health report, it was found that a significant health concern is the incidence of skin cancers diagnosed in older adults in the rural agricultural industry.

Methods Used An asset-based approach was utilized to evaluate current programs and community organizations addressing the issue of skin cancer prevention in Powell. Park County Public Health provides opportunities for cancer detection programs; however, they do not provide any programs or education about sun safety practices or skin cancer prevention.

Interventions were assessed using an in-depth literature review, as well as clinical observations and interviews with patients and providers at PVHC.

Summary of Results The CDC states that the incidence of new skin cancers diagnosed in Park County, WY from 2013–2017 were higher than the national average. Several reasons for this include the amount of Powell's community that are employed in the agricultural industry in which workers spend many hours in direct sunlight. Furthermore, many adults in Powell that are farmers and ranchers have the good ol' 'Cowboy Attitude,' in which they don't seek medical attention when it's necessary. Lastly, there is a lack of education and utilization of skin cancer preventative practices. Several interventions were evaluated, including utilizing informational text messaging as well as providing skin cancer education posters with QR codes in businesses frequented by the agricultural working population.

Conclusions Partnering with a community organization that is already trusted by the population gives a community the ability to utilize their strengths in order to foster solutions to public health concerns. Additionally, an asset-based approach allows the collaboration and cooperation between community organizations to work together towards a common goal. The most meaningful aspect of this experience was implementing a potential interprofessional collaboration with providers at PVHC, patients in the community, and the public health officers that serve them.

382 ADOPTING A COLLABORATIVE CARE APPROACH TO INCREASE ACCESS TO MENTAL HEALTH CARE IN EVANSTON, WYOMING

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10.1136/jim-2021-WRMC.380

Purpose of Study Patients and providers in Evanston, Wyoming cited lack of access to mental health care and inability to afford care as the area's biggest health concerns. The poverty rate and rates of mental health and self-harm mortality are higher than the national average; there is limited access to outpatient psychiatric appointments. Evanston is home to the State Hospital, an inpatient psychiatric hospital, which attracts patients in need of mental health care to the area.

Methods Used Patient and provider interviews were conducted at Arrowhead Family Medicine to detect community health concerns, risk factors and resources. An asset-based research approach was then used to identify community-based organizations working to combat the community's mental health concerns. Interviews with High Country Behavioral Health (HCBH), a mental health nonprofit, elucidated programs available to the community and areas for growth. A literature review was then conducted to identify strategies for increasing access to mental health care in Evanston. Information obtained from interviews and clinical observations narrowed the solutions to those that were reasonable for the area.

Summary of Results A collaborative care approach was identified as the best method for increasing access to mental health care in Evanston. This model integrates mental health care into the primary care clinic using a team of case managers, primary care physicians and psychiatrists for consultations. It decreases wait times for mental health visits, allows patients to address mental and physical health concerns together and reduces costs. HCBH is state-funded and can provide sliding

scale care. They have partnered with Arrowhead Family Medicine to place a mental health counselor in the clinic, which reduced stigma and increased care access.

Conclusions The asset-based research approach identified community resources that could be grown to reach a larger population of patients with mental health concerns. The partnership between HCBH and Arrowhead could be modified using the collaborative care model with HCBH counselors as case managers. This would help ensure that patients are receiving more effective and affordable mental health care in the primary care clinic. This program could be expanded to more clinics by building onto existing community resources to benefit more patients.

383 CURRENT PRACTICES AND TRAINING AMONG PROVIDERS REGARDING CLEFT PALATE FEEDING

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Purpose of Study A baby born with a cleft palate has an opening in the roof of their mouth into the nose which prevents the infant from extracting milk from a traditional nipple. Infants with cleft palate are prone to feeding difficulties if adaptive feeding mechanisms are not utilized. Cleft palate feeding spans across disciplines. Due to the lack of information with regard to current feeding practices followed by healthcare providers and their training, the purpose of this study was to describe 1) the current trends in feeding practices by providers involved in cleft care, and 2) the training received regarding feeding of infants with cleft palate.

Methods Used The University of Wyoming Institutional Review Board (IRB) approved this project. A qualitative multiple case study approach was employed. Participants included 4 craniofacial feeding providers. Although participants had experiences in common, the researchers wished to accentuate the uniqueness of each participant. The design utilized a semi-structured interview for data collection. Interpretive data analysis informed researchers' understanding through scrutiny of each case and a search for cross-case similarities. Researchers completed final coding of all transcripts and resolved disagreements through discussion and refining of theme descriptions. Intra- and inter-rater reliability was achieved. Debriefing by participants served to confirm the data validity.

Summary of Results The final qualitative data analysis revealed the following emergent themes: 1) Informal training mechanisms as the dominant form of education, 2) Similarities in the components of a feeding consult, 3) Variations of practice in the multi-disciplinary aspects of feeding, and 4) Clinical expertise as the main component of evidence-based practice. Additionally, themes of clinical and educational issues arose from the interviews.

Conclusions Informal training mechanisms are the primary form of education for providers across disciplines regarding cleft palate feeding. Practice was informed primarily by clinical expertise. There was an overwhelming concern for more formal training mechanisms for cleft palate feeding. These findings will help guide future research aimed to better understand feeding practices and improve training among providers regarding cleft palate feeding.

384 RECENT APPROACHES AND CLINICAL TRIALS TARGETING PANCREATIC ADENOCARCINOMA INVASIVENESS AND THE TUMOR MICROENVIRONMENT

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Purpose of Study The current management of pancreatic ductal adenocarcinoma (PDAC) with chemotherapy and complete surgical resection has limited efficacy, and the overall 5-year survival of patients diagnosed with PDAC has had limited improvements over the past two decades. This study summarized the current understanding of the PDAC tumor microenvironment (TME) and reviewed novel targeted approaches and clinical trials that address these components in order to improve treatment.

Methods Used Published papers addressing pancreatic cancer and its TME or components of the desmoplastic stroma within the past ten years were identified using PubMed. All clinical trials reviewed were found through clinicaltrials.gov. The review period included clinical trials conducted from 2003–2020.

Summary of Results Experimental therapies targeting the desmoplastic stroma include FAK inhibition and recombinant hyaluronidase, and are currently being evaluated in clinical trials. There are currently several cancer vaccine trials underway. For example, GVAX, which modifies cancer cells to release granulocyte-macrophage colony stimulating factor (GM-CSF), has shown promising, but mixed, results in some patients. Further clinical trials combining GVAX with chemotherapies and immunotherapies are necessary to assess its relevance in the scope of PDAC treatment. Other cancer vaccines targeting proteins such as mutant Ras, mucins, and kinesins, also remain to be promising targets, and are pending completion of clinical trials. Several other targeted therapies, such as chemokine ligand 12 (CXCL12) inhibitors which mitigate the prominent effects of cancer associated fibroblasts in the PDAC TME serve as promising targets for immunotherapy.

Conclusions Although there have been many robust in-vitro and small animal studies evaluating the components of PDAC TME as targets for treatment, translation to humans remains challenging. New clinical trials targeting molecules of the desmoplastic stroma and TME offer hopeful promise for the field.

385 A RARE CASE OF MALIGNANT HEMANGIOENDOTHELIOMA

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Introduction Epithelioid hemangioendothelioma was first described in 1975 as a vascular tumor featuring both hemangioma and angiosarcoma. They are rare, locally aggressive tumors with metastatic potential. Vascular origin often includes lung, spleen, bone, breast, and liver. Renal involvement has been exceedingly rare in both practice and literature. Prevalence is estimated to be less than one in one million. We describe a case of rapidly progressive renal hemangioendothelioma with extensive local invasion.

Case Presentation 43-year-old male with iron deficiency anemia and patent foramen ovale presented with left side abdominal pain, unintentional weight loss, and painless hematuria for 2 months. Family history was unremarkable.

Physical examination revealed a 5 cm palpable mass in the left lower quadrant. CT abdomen showed a 12×10 cm cystic mass at the inferior pole of the left kidney. CEA and CA 19-9 were normal. MRI abdomen and repeat CT approximately 5 weeks after the initial study demonstrated interval increase in size to 19×18 cm and patient was found to have diffuse lymphadenopathy, retroperitoneal tumor implants, and a new mass in the tail of the pancreas. Biopsy immunohistochemistry was consistent with malignant epithelioid hemangioendothelioma as evidenced by the expression of CD10, vascular markers CD31 and FLI-1, and lack of CD34. Cytoreductive nephrectomy was deferred as hospital course was complicated by CVA with acute thalamic infarct and bilateral hemianopia. He was then transferred to higher level of care for debulking. Repeat CT abdomen showed progression in size of the mass relative to imaging four days prior. Omental tumor infiltrates were noted in addition to involvement of the left adrenal gland, splenorenal ligament, and psoas muscle. Open nephrectomy was attempted by urologic oncology however the procedure was aborted due to numerous peritoneal metastases. Given disseminated disease and poor prognosis, palliative care was initiated.

Discussion Hemangioendotheliomas are uncommon neoplasms of vascular origin that are rarely associated with renal pathology. This case demonstrates a unique case of rapidly progressive renal hemangioendothelioma which was unresectable due to aggressive local and distant invasion.

386 ANTI-PROGRAMMED DEATH LIGAND 1 (PD-L1) INHIBITOR INDUCED ADRENAL INSUFFICIENCY

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Purpose of Study Adrenal insufficiency is a condition in which the adrenal glands do not produce adequate amounts of steroid hormones, primarily cortisol. There are instances where central dysfunction can induce adrenal insufficiency. This is a well-observed complication of an array of immune checkpoint inhibitor (ICI) therapies. Of all the different target sites of immune checkpoint inhibitors, anti-programmed death ligand 1 (PD-L1) has the least causing effect of hypophysitis.

Methods Used A 52-year-old woman with past medical history of small cell lung cancer completed Atezolizumab treatment three weeks prior, presents with intractable nausea and vomiting for three weeks. Her symptoms were unresponsive to multiple anti-emetics therapy. Patient was initiated on IV Pantoprazole with minimal improvement. In such, a diagnosis of central adrenal insufficiency induced by Atezolizumab was determined.

Summary of Results Our patient completed a series of Atezolizumab (PD-L1) treatment for her small cell lung cancer. Her presentation with fatigue, loss of appetite, nausea and vomiting unresponsive to anti-emetics therapy encouraged us to look for underlying endocrine pathology. The Cortisol random and morning level showed (1.8 mcg/dL) and (1.9 mcg/dL) respectively. Cosyntropin stimulation test resulted in very low ACTH. CT Abdomen demonstrated 13 mm dilatation of the common bile duct with normal gallbladder. Liver function tests were within normal limits. MRCP demonstrated narrowing secondary to inflammatory

constriction. EGD showed erosive gastritis with no peptic ulcer disease or gastric malignancy. The diagnosis of central adrenal insufficiency was confirmed with a low ACTH post cosyntropin stimulation test. Patient was started on IV Hydrocortisone which drastically improved her nausea and vomiting.

Conclusions Immune checkpoint inhibitors have been the new frontline in treating cancer. This case illustrates the importance of broader differential diagnosis for intractable nausea and vomiting after chemotherapy. These results suggest a caution for the late-onset central adrenal insufficiency associated with hypophysitis in patients treated with anti-PD-L1 antibodies.

387 WHEN SHOULD I TRANSFUSE? RESTRICTIVE VERSUS LIBERAL RED BLOOD CELL TRANSFUSION THRESHOLDS FOR ADULT CANCER PATIENTS

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Purpose of Study Anemic cancer patients comprise the largest 'single' user of red blood cell (RBC) transfusions in the United States. RBC transfusions offer the most rapid correction of hemoglobin levels for anemia but constitute a limited resource associated with a variety of risks. Current guidelines for RBC transfusion thresholds in anemic cancer patients are based on limited and outdated data. This narrative review describes the latest findings about the effectiveness and safety of using a restrictive versus liberal RBC transfusion threshold for anemic adult cancer patients undergoing myelosuppressive therapy.

Methods Used A search of the literature in PubMed/Medline and Embase was performed. Search terms included: (1) cancer AND (2) chemotherapy OR radiation AND (3) anemia AND (4) blood transfusion AND (5) liberal OR restrictive AND (6) survival OR quality of life OR transfusion reaction OR adverse effect. Inclusion criteria consisted of articles that investigated transfusion threshold impact on survival/mortality, quality of life, and/or transfusion reactions in adult patients with a diagnosis of cancer (solid or hematologic) who were receiving chemotherapy or radiation therapy.

Summary of Results After performing a controlled search and removing duplicates, 68 articles were identified. Overall, 7 studies involving a total of 968 patients met the inclusion criteria. Of these studies, 6 described survival/mortality rates, 4 described quality of life, and 2 described incidence of transfusion reactions. Limited and low-quality evidence suggests the use of restrictive versus liberal RBC transfusion thresholds does not appear to impact survival/mortality rates, quality of life, or transfusion reaction incidence in anemic adult cancer patients undergoing myelosuppressive treatments.

Conclusions There is a paucity of high-quality evidence regarding the efficacy and safety of using a restrictive or liberal RBC transfusion threshold in anemic adult cancer patients undergoing myelosuppressive treatments. More research needs to be done to determine the optimum RBC transfusion threshold for this population. If survival/mortality and transfusion reaction incidence are truly similar between groups, the emphasis should be placed on an individual patient's quality of life while receiving treatment.

388 **SORAFENIB AND CAPECITABINE IN RECURRENT FIBROLAMELLAR HEPATOCELLULAR CARCINOMA: A NOVEL ORAL CHEMOTHERAPY APPROACH**

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Purpose of Study Fibrolamellar hepatocellular carcinoma (FL-HCC) is a rare variant of hepatocellular carcinoma occurring predominately in pediatric and young adult patients. Currently, complete surgical resection with lymphadenectomy is the cornerstone treatment for long-term survival. Disease recurrence is unfortunately high at 33% to 100% with no universal standard of care for unresectable FL-HCC. We present a case of a 13-year-old female with FL-HCC who had previously undergone multiple total resections due to recurrence, but presented with unresectable disease two years after diagnosis.

After the family refused intravenous chemotherapy, an oral approach combining Sorafenib and Capecitabine, based on an institutional study in adults, was initiated. The primary objective was disease control.

Methods Used Treatment schedule was based on a 28-day cycle planned to continue until disease progression. The patient received Capecitabine 1300 mg/m²/day in divided BID doses on days 1–7 and 14–21, and Sorafenib 400 mg/m²/day in divided BID doses on days 1–28 for 24 cycles. In subsequent cycles, Capecitabine dosing was decreased to days 1–7, given continued stable disease. Therapy was discontinued after 36 cycles. Close tumor surveillance with imaging and laboratory studies occurred every three months for the duration of treatment and continued off therapy.

Summary of Results The patient demonstrated disease regression and continued without disease progression on treatment for 36 cycles. The regimen was well tolerated with minimal side effects of dry skin (CTCAE grade 1) and a transient episode of brief erythrodysesthesia (CTCAE grade 2) that resolved spontaneously. Following discontinuation of therapy the patient remains without evidence of disease now 24 months off treatment.

Conclusions The combination of Sorafenib and Capecitabine was effective and well tolerated in this adolescent with FL-HCC. Our observations, although in a single patient, lend support for further testing of this novel oral chemotherapy regimen in patients with FL-HCC, a disease for which there is no effective standard chemotherapy approach.

389 **ASSESSING THE NEED FOR A COMPREHENSIVE CARE MODEL FOR SICKLE CELL DISEASE CARE**

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Purpose of Study To assess national SCD quality indicators at Kern Medical and identify possible areas of improvement.

Methods Used Chart review of 61 patients over a 6-year period.

Summary of Results In this study, we used the national SCD quality measures such as visits with PCP, ED visits, hospital admissions, transfusion treatment, hydroxyurea use, access hematologist and pain specialists. After review of the data,

there were multiple areas that indicated the need for a multi-disciplinary team approach in handling the care of SCD patients in our institution. The most common complications that resulted in inpatient admission were pain crisis (50.8%), acute chest syndrome (19.6%), and avascular necrosis (9.8%). However, what is most glaring is that only 18.0% of patients had access to a pain specialist and only 22.9% had close follow up with a hematologist, which lead to a low number of these patients having access to transfusion centers (45.9%), use of hydroxyurea (37.7%), and utilization of hemoglobin electrophoresis (37.7%).

Conclusions Although treatment for SCD has vastly improved over the last few years, many patients with SCD rely on the ED as their mode of primary care. From our study it was obvious that the quality indicators were poor and highlighted the need for a SCD clinic. However, this is not isolated to our institution. In 2016 there were over 134,000 SCD related inpatient hospital admissions with over 75% involving a pain crisis, and 1/3 resulting in a 30-day readmission. The implementation of the National SCD quality measures, including use of primary care providers, ED visits, hospital admissions, transfusion, hemoglobin electrophoresis, and access to hematologists will help objectively quantify the level of care these patients receive. This study aimed to assess the quality indicators of SCD, identify challenges and opportunities for improvement of the care of SCD patients, as well as to guide the creation of a comprehensive profile for SCD patients. We hope to follow up this study in a few years to objectively measure our progress.

390 **GRIFOLS-LUMINEX DISCORDANCE FOR BURNETT GODSPEED ANTIBODY**

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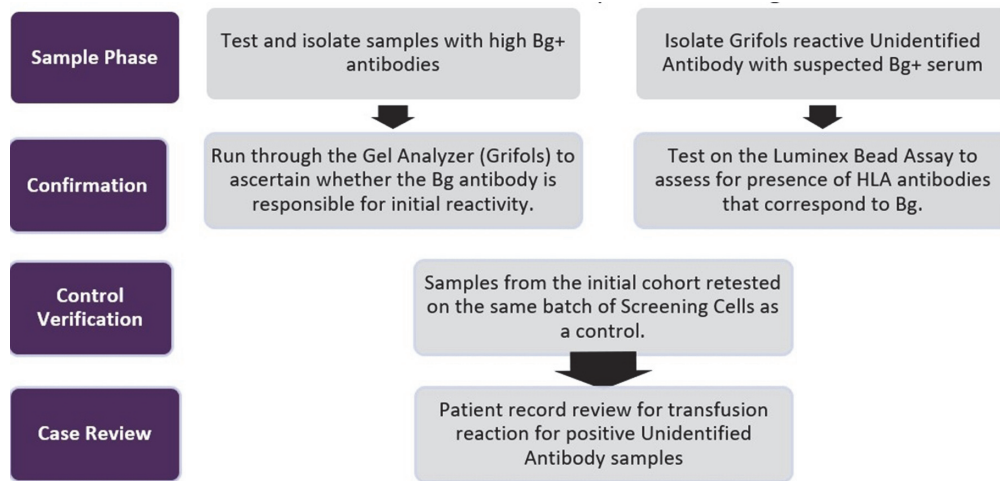
10.1136/jim-2021-WRMC.388

Purpose of Study Antibodies directed to foreign Human Leukocyte Antigens (HLA) may be a barrier to transplant and are therefore of unique interest to transplant medicine. Class I HLA are found on all nucleated cells, with certain Class I HLA Antigens weakly expressed on RBC, called Bg Or Bennet Godspeed antigens. Antibodies to these antigens have been recorded and have been implicated in acute and delayed transfusion reactions.

This project seeks to determine whether the positive agglutination reaction seen in antibody screens at a regional blood bank is the result of interfering Bg antibodies in patient samples using a 2-step testing approach explained below.

Methods Used Serum from kidney transplant patients collected between 4/2020 to 8/2020 was stored at -20C and patient plasma samples were kept under refrigeration. See Method Schematic for dual testing approach.

Summary of Results Testing of Bg positive samples resulted in no agglutination on the Grifols. Testing of agglutinated gel samples on the Luminex showed 1 sample with Bg antibody present. Case review of the sample identified yielded an acute non-hemolytic transfusion reaction, supporting current literature that HLA Class I antibodies, including Bg antibodies, may be a cause of transfusion reactions.



Abstract 390 Figure 1 Methodology schematic

Abstract 390 Table 1 Grifols Gel and luminex bead assay results from patient samples

| Sample | Grifols Control Test | Luminex MFI Levels | | | Transfusion Reaction |
|-----------|----------------------|--------------------|--------|--------|----------------------|
| | | BgA | BgB | BgC | |
| Luminex 1 | 2 | 0 | 0 | 0 | - |
| Luminex 2 | 0 | 0 | 0 | 0 | - |
| Luminex 3 | 1 | 0 | 0 | 0 | - |
| Luminex 4 | 0 | 0 | 0 | 0 | - |
| Luminex 5 | 0.5 | 0 | 0 | 0 | DHTR* |
| Luminex 6 | 2+ | 19,000 | 10,000 | 19,000 | ANHTR* |

Conclusions In conclusion, Grifols reactivity was discordant with Luminex results for the Bg Antibody.

These results suggest that interference of some other unidentified antibody is responsible for this reaction and that Bg antibodies in patients are not responsible for the reactivity seen in gel testing methodology.

391 RIGHT OVARIAN VEIN THROMBOSIS WITH ASEPTIC THROMBOPHLEBITIS

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Purpose of Study Ovarian vein thrombosis is a rare but potentially serious condition associated with the post-partum period. We describe a case of ovarian vein thrombosis in a young female with a history of hemophagocytic lymphohistiocytosis in remission.

Methods Used Retrospective case report

Summary of Results A 23-year-old Hispanic G2P2 presented to the Emergency Department for acute onset of right low back pain and right lower quadrant abdominal pain for eight days. On admission, the patient was hemodynamically stable and afebrile. The patient was post-partum day ten from a normal spontaneous vaginal delivery to dichorionic diamniotic twins. The patient was treated at an outside facility five days prior to presentation for the same complaint and was given cefalexin for a presumed urinary tract infection with no improvement.

The patient’s past medical history was significant for an allogeneic stem cell transplant for hemophagocytic lymphohistiocytosis, thought to be secondary to adult-onset Still’s disease versus EBV versus prior intrauterine fetal demise. CT abdomen and pelvis showed an intraluminal thrombus compressing the inferior vena cava and a thrombus in the right common iliac vein. MRI showed a large occlusive thrombus in the right gonadal vein extending to the IVC below the renal veins, with surrounding inflammatory changes suggestive of thrombophlebitis. The patient was treated with a therapeutic dose of Lovenox of 1 mg/kg every twelve hours and prophylactically with Piperacillin and Tazobactam 4.5 g every eight hours. During hospitalization, she was febrile one time with a Tmax of 38°C. Antibiotics were discontinued on hospital day three. The patient was discharged on Warfarin 5 mg daily with close follow-up as she desired to breastfeed. The patient has been asymptomatic at all subsequent outpatient appointments.

Conclusions Ovarian vein thrombosis can have both a variable course and clinical presentation, and should be included in the differential of abdominal pain in a female. This case highlights the importance of prompt recognition and appropriate treatment to prevent potentially grave progression such as pulmonary emboli or sepsis.

392 A CASE OF MULTIPLE MYELOMA PRESENTING WITH INCREASED CONFUSION AND BEHAVIORAL CHANGES

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Introduction Multiple myeloma is an uncommon, hematological malignancy that accounts for 1–2% of all cancers in the United States. Patients can present acutely with neurologic changes and requiring interventions related to kidney failure, hypercalcemia, spinal cord compression, amongst others. It is a disease in which some patients rapidly progress despite treatment and others respond to treatment for many years.

Case Report A 63-year-old Hispanic gentleman with no significant past medical history presented to the hospital with stupor, confusion, and behavioral changes accompanied with a 40-lb weight loss. His symptoms began one month prior to presentation and progressed quickly, resulting patient's family to seek medical attention. Examination was unremarkable as the patient did not have any complaints or exhibit any other signs of disease. Laboratory workup revealed various abnormalities including a serum calcium of 16.2 mg/dL, a blood urea nitrogen 49 mg/dL, creatinine of 5.47 mg/dL, & hemoglobin of 5.8 g/dL. Additionally, imaging demonstrated mild L1 compression fracture and multilevel degenerative changes most pronounced L4-L5. The patient was admitted to the hospital for the treatment of his hypercalcemia and acute renal failure. Despite dialysis and resolution of the hypercalcemia, the patient continued to be altered however clinically and hemodynamically stable, with no further deterioration in clinical course. Further studies demonstrated a total protein of 14 grams, IgA level of 9000 mg/dL, and total kappa light chain of >600 mg/dL with a bone biopsy confirming diagnosis of multiple myeloma. A decision not to initiate plasmapheresis was made. Instead, the patient was started on an inpatient chemotherapeutic regimen consisting of bortezomib, cyclophosphamide, and bortezomib and followed up outpatient, where he was seen to have significant improvement in his condition.

Discussion Confusion and behavioral changes carry a multifactorial etiology. The patient had progressive confusion and behavioral changes can be attributable to many aspects of multiple myeloma. Despite management of these causes, eg) hypercalcemia, or uremia due to acute renal failure, his confusion persisted pointing to hyperviscosity syndrome as the culprit.

393 MULTIPLE NEW ONSET PYOGENIC GRANULOMAS DURING TREATMENT WITH PACLITAXEL AND RAMUCIRUMAB

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Case A 59-year-old female presented to dermatology clinic with chief complaint of red, itchy, bleeding skin lesions for one month. She denied any preceding trauma to the areas. Past medical history was significant for gastroesophageal junction adenocarcinoma diagnosed more than two years prior to presentation. She was started on combination therapy of paclitaxel (PTX) and ramucirumab five months before presentation. On physical exam, five friable, hemorrhagic papules and nodules ranging in size from 3 mm-10 mm were present on the chest, right cheek, and right forearm consistent with pyogenic granulomas (PGs). Biopsies demonstrated lobular aggregates of small caliber vessels set in an edematous inflamed stroma, and partially enclosed by small collarettes of adnexal epithelium, confirming the clinical diagnosis.

Discussion The development of PG, a vascular tumor, during treatment with the VEGFR2 inhibitor ramucirumab whose mechanism of action is to inhibit angiogenesis is inherently paradoxical. In 2015, a rapidly expanding angioma with a mutation in the gene which encodes VEGFR2 (*KDR*) was identified in a patient undergoing ramucirumab therapy. The authors of the case report suggested that *KDR* mutation results in paradoxical activation of VEGFR2 in the setting of ramucirumab therapy. Since then, others have suggested that ramucirumab and paclitaxel have a synergistic effect in vascular proliferation, though an exact mechanism has not been proposed. While none have repeated genetic studies to identify the presence of *KDR* mutations, it is possible that the patients who develop PG and other vascular tumors during combined taxane and ramucirumab therapy have a mutation that makes them more susceptible to VEGFR2 upregulation. Following long term outcomes for these patients may provide important information on the efficacy of the antineoplastic regimen in the subset of patients who develop cutaneous vascular tumors during treatment regimens designed to reduce angiogenesis. The number of vascular tumors may also be an important marker.

In conclusion, our case is the first report of multiple new onset pyogenic granulomas in a patient undergoing treatment with PTX and ramucirumab.

394 RARE GINGIVAL METASTASIS OF INVASIVE DUCTAL ADENOCARCINOMA OF THE BREAST: CASE REPORT AND LITERATURE REVIEW

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Case Report A 36 year old female with a two year history of breast cancer presented in 2017 with a mass in her retromolar trigone. MRI showed thoracic and lumbar osseous metastases of ductal adenocarcinoma of the breast. In December 2018 she reported additional symptoms of severe pain in the left mandible, the right hip, and the right shoulder. A PET scan and subsequent biopsy in July-August 2019 pointed to the presence of additional osseous metastatic lesions as well as a new tumor metastatic to the left posterior retromolar trigone originating from the mandible.

Our patient was already on an endocrine therapy regimen to treat her widespread osseous metastatic disease prior to the discovery of additional metastatic lesions. After counseling she chose chemotherapy and palliative radiation for disease management. Literature review of mandibular manifestations of metastatic breast cancer was conducted using search terms 'mandibular,' 'breast cancer' and 'metastasis' on PubMed.

Results Literature review has shown that breast cancer does not commonly metastasize to the oral mucosa. Masses of the head and neck originating from primary neoplasia of the breast usually indicates widespread systemic metastatic disease. Yet in secondary gingival neoplasias, cancer of the breast is among the most common origins alongside kidney, lung, and female genital organ cancers.

Conclusions This report indicates the rare, yet clinically significant, finding of oral mucosa lesion metastasis originating from the breast. It encourages the consideration that soft tissue



Abstract 394 Figure 1 Lesion visible in the left gumline likely originating from the left mandibular metastasis from the breast

primary neoplasm is an underlying factor in the differential work-up of oral lesions among women.

395 LITERATURE REVIEW IN SUPPORT OF THE IMPLEMENTATION OF A NEWBORN SICKLE CELL DISEASE SCREENING PROGRAM IN NEPAL

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Purpose of Study Since 2015, University of British Columbia medical students in partnership with Creating Possibilities have traveled to rural Nepal for sickle cell disease (SCD) screening and education. After reviewing work from previous teams and consulting the literature, we identified a newborn SCD screening program as a pivotal aspect of achieving a sustainable solution for the program moving forward. Implementing such a program would require Nepalese governmental support. Therefore, we synthesized information on newborn SCD screening with future hopes to lobby the government for its implementation.

Methods Used Literature reviews on three sub-topics of newborn SCD screening programs were conducted. These included: reported morbidity and mortality benefit, required health interventions to produce such a benefit, and the program's cost-effectiveness. After consulting a librarian, a search strategy was generated and information was compiled on each of these topics.

Summary of Results Under-five mortality can be dramatically reduced with a newborn SCD screening program through early identification allowing for timely initiation of care. The most important early life interventions include prophylactic penicillin, immunizations, and comprehensive medical follow-up with SCD education. Most authors agree that newborn SCD screening programs are highly cost-effective, largely depending on a country's incidence of newborn SCD and birth rate.

Conclusions The reported morbidity and mortality benefits of a newborn SCD screening program are well established throughout both high- and low-income countries, as well as subsequent management options once a case is confirmed. Although other low-income countries have found newborn SCD screening to be highly cost effective, such an analysis needs to be conducted within Nepal. This starts with a pilot newborn SCD screening program to determine the incidence of newborn SCD.

396 NEONATAL NET INHIBITORY FACTOR INHIBITS MACROPHAGE EXTRACELLULAR TRAP FORMATION

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Purpose of Study Neutrophil extracellular traps (NETs) are web-like structures composed of decondensed chromatin and antimicrobial proteins. NETs contribute to antimicrobial defense. Dysregulated NET formation, however, leads to inflammatory tissue damage in many disease states including sepsis. Neonatal NET-inhibitory factor (nNIF), a novel peptide found in fetal circulation, inhibits NET formation and improves survival in mouse models of sepsis. Macrophages, immune cells known to perform a variety of functions, also produce extracellular traps (METs). METs are composed of many of the same antimicrobial peptides and may contribute to inflammatory tissue damage. Whether nNIF inhibits MET formation without impacting other important macrophage functions remains unknown. We hypothesize the nNIF inhibits MET formation without inhibiting macrophage phagocytosis.

Methods Used Mouse macrophages (J774.1 cell line) were purchased from American Type Culture Collection (ATCC) and used for all experiments. MET formation was induced by incubating macrophages with *E. coli* at a multiplicity of infection (MOI) of 4 for 4 hours. Macrophages were pretreated for 1 hour with nNIF (20 nM) or an inactive scrambled control peptide (20 nM) prior to stimulation with *E. coli*. We assessed MET formation with high-throughput DNA quantification and through direct visualization via confocal microscopy. In a separate experiment, we stimulated nNIF pretreated macrophages with fluorescently labeled *E. coli* particles at an MOI of 8. We quantified phagocytosis by calculating a phagocytic index (number of internalized particles per cell) using confocal microscopy.

Summary of Results *E. coli* stimulation leads to a 5-fold increase in MET formation compared to baseline controls. Pretreatment with nNIF significantly inhibits MET formation, while pretreatment with an inactive scrambled control peptide does not (N=12, p-value \leq 0.0001). Macrophages successfully phagocytose fluorescently labeled *E. coli* particles, and nNIF pre-incubation does not inhibit phagocytosis.

Conclusions We conclude that nNIF inhibits MET formation without inhibiting phagocytosis. We speculate that, as it does in neutrophils, nNIF inhibits extracellular trap formation in macrophages without impacting other critical macrophage functions.

397 MORE THAN AN ANTIDEPRESSANT: BUPROPION IN PSORIASIS TREATMENT

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Purpose of Study Bupropion is widely used as an antidepressant and as an adjunctive aid in smoking cessation. However, studies have suggested that bupropion may be used in patients with psoriasis due to the medication's anti-inflammatory effects. The purpose of this study is to analyze the current literature on the use of bupropion in the treatment of psoriasis.

Methods Used A literature review was conducted to understand the effects of bupropion on psoriasis. We searched

PubMed articles starting from the FDA-approval date for bupropion in 1986 to 2019 for our analysis. Five articles were included in the final analysis, representing a total of 16 patients.

Summary of Results Overall, more than half of the patients in this analysis displayed improvements in psoriasis symptoms which was evident by a decrease in affected surface area compared to baseline. Those who experienced exacerbations of psoriasis symptoms were reported to develop generalized pustular or erythrodermic flares. Specifically, nine patients experienced improvements, five patients experienced exacerbations, and two patients experienced no changes in psoriasis symptoms.

Conclusions This review serves to illustrate the potential benefits of bupropion in the treatment of psoriasis. In addition, there is molecular support for a plausible mechanism of bupropion on psoriatic disease through lowering the levels of TNF-alpha. This mechanism may be complementary to the current TNF-alpha inhibitors utilized for psoriasis treatments. Although it is notable that bupropion may be considered an alternative to other psoriasis medications, it is important to assess the risks and benefits involved. Bupropion has been associated with causing changes in behavior, including hostility, agitation, depressed moods, or suicidal thoughts. Although the majority of patients showed benefits of symptom improvement, an assessment of risks and factors involved in symptom progression is difficult to make with a limited number of patients in our analyses. Given these considerations, it may be beneficial to conduct a larger clinical trial with a multi-disciplinary approach involving dermatologic, psychiatric, and rheumatologic collaboration to define the possible importance of bupropion on psoriasis treatment.

398 DOES PREGNANCY LEAD TO THE DEVELOPMENT OF ANTI-CYCLIC CITRULLINATED PEPTIDE ANTIBODIES?

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Purpose of Study Rheumatoid arthritis (RA) is a systemic autoimmune disease that affects women more often than men. There is a 6-fold increased risk of developing RA during the postpartum period, but the etiology of this risk is unknown. The goal of this study was to determine whether pregnancy is associated with increased prevalence of RA-related autoantibodies, specifically anti-cyclic citrullinated peptide (CCP) antibodies, which have been identified in the blood prior to the onset of joint disease in RA.

Methods Used Stored serum samples were obtained from 340 RA-free women in their 3rd trimester of pregnancy and 142 pre-menopausal, non-pregnant RA-free women controls. All samples were tested for commercial anti-CCP assays, specifically CCP3 (IgG Inova) and CCP3.1 (IgG/IgA Inova). Questionnaires were used to assess women's health and smoking histories. Chi-square/Fisher's exact testing were used to compare groups.

Summary of Results The prevalence of anti-CCP positivity did not differ between pregnant and non-pregnant women. Within the pregnant women, there was no difference in anti-CCP

Abstract 398 Table 1 Subject characteristics

| | Pregnant (n = 340) | Non-pregnant (n = 142) | p-value |
|----------------------|--------------------|------------------------|---------|
| Ever pregnant | 100% | 31% | <0.01 |
| Average age (SD) | 30 (5) | 31 (8) | 0.02 |
| Ever smoker | 30% | 15% | <0.01 |
| Family history of RA | 0% | 5% | <0.01 |

Abstract 398 Table 2 Anti-CCP Positivity

| | Pregnant (n = 340) | Non-Pregnant (n = 142) | p-value |
|----------------------|--------------------|------------------------|---------|
| Anti-CCP3 Positive | 2.1% | 1.2% | 0.43 |
| Anti-CCP3.1 Positive | 1.4% | 1.5% | 1.00 |

positivity based on age, history of ever-smoking, or sexually transmitted infection during pregnancy.

Conclusions We did not find an association between pregnancy and systemic anti-CCP antibodies. These data suggest that the increased risk of developing RA in the postpartum period is not due to increased systemic anti-CCP development during pregnancy. However, additional studies are needed to evaluate the influence of genetics on the development of anti-CCP during pregnancy and postpartum.

399 INFLAMMATION RESPONSE OF EPITHELIAL CELLS TO CELL PHONE PROXIMITY

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Purpose of Study There is evidence that the radio waves emitted from cell phones cause thermal heating to contacted areas of skin. It is not known whether this heating leads to inflammation on a cellular level. The release of cytokines and other inflammatory mediators can damage tissues and lead to cell death. The present study attempted to investigate whether a cell phone in calling mode can induce an inflammatory response, or change cell viability in proximal epithelial cells. We hypothesize that radio wave exposure can increase the inflammatory cascade in the cells, hence affecting homeostasis of the exposed cellular tissue for further tissue damage over prolonged time.

Methods Used In an in vitro cell culture model, airway epithelial cell line 1HAE0 was exposed to cell phone radiations for two time durations: 1-hour exposure and 3-hour exposure. Stimulated cells were compared with unstimulated control cells. Since cell phone call-mode was interrupted in the closed incubator, cell phone stimulation was done in water bath maintained at 37°C. Cells were transferred back to incubator after the appropriate stimulation for 15 hours. Cell free condition media was collected for interleukin (IL) -8 ELISA as an indicator of inflammation. Cell viability was tested by an Alamar Blue Assay. One-way ANOVA was used to analyze the data.

Summary of Results Data from this study demonstrated a significant increase in IL-8 concentration with 1h and 3h ($p < 0.0001$) exposure to cell phone radio waves when compared with unstimulated cells. In contrast, there was no difference in IL-8 concentration when exposure durations were compared. Furthermore, cell viability was similar across all conditions ($p > 0.05$).

Conclusions In response to a proximal cell phone in calling mode, epithelial cells increase the secretion of IL-8 indicating an inflammatory response. However, increased duration of exposure does not seem to further increase IL-8 levels. As well, cell viability is not impacted by cell phone exposure. While it is unknown what impact cell phones have on overall cellular health, this research raises important questions about whether the thermal output of a cell phone can lead to inflamed tissues.

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VACCINE AGAINST SARS-COV-2 SPIKE PROTEIN RBD USING COMPLEMENT C3 TARGETED LIPOSOMES FOR IMMUNE ACTIVATION

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Purpose of Study An effective vaccine against SARS-CoV-2 should activate both humoral and T cell responses, as antibodies alone have been shown inadequate for sustained protection. A possible target for such a vaccine includes the receptor-binding domain of the Spike protein (S-RBD). We evaluated the use of C3-liposomes to directly target and deliver encapsulated S-RBD to antigen presenting cells (APCs) to initiate immune recognition by effector cells in a manner that mimics pathogen engulfment. C3-liposomes allow for delivery of Toll-like receptor (TLR) agonists, (e.g. R848) which simulate pathogen-associated patterns, inducing co-stimulatory molecule expression that helps direct the immune response. We hypothesize that C3-liposome encapsulated S-RBD would induce greater immune responses as measured by IgG levels and T cell responses when compared to controls.

Methods Used Mice ($n=3$) were treated with C3-liposomes and control conditions. Blood and spleen were collected 14 days after initial immunization and examined by ELISA, ELISpot, and flow cytometry.

Summary of Results There was a potent antibody response after vaccination with C3-liposomes containing S-RBD. ELISA showed 5-fold greater IgG expression in the C3-liposome S-RBD group versus free S-RBD and 1.5-fold greater expression versus control-liposomes. While results were not statistically significant with $n=3$, it is likely that significance could be achieved with additional mice. Vaccination with ovalbumin (OVA: mock antigen) looking at cytokines IL-4 and IFN- γ showed that C3-liposomes with OVA versus control-liposomes or free OVA had significant T-cell activation (p values: IL-4: 0.0304, 0.0407; IFN- γ : 0.0003, 0.0019). ELISpot and flow cytometry looking at T-cell activation was not effective for the S-RBD; our current protocol is optimized for peptides and not full-length S-RBD. We are repeating studies using preincubations prior to ELISpot in an attempt to accurately measure cell response.

Conclusions These results could improve liposome-based vaccines such as those by Moderna, Novavax, and BioNTech for SARS-CoV-2, enabling development of a robust and lasting immune response by targeting antigen and adjuvant directly to APCs in a manner that replicates an infection.

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WOUND BOTULISM IN BLACK TAR HEROIN INJECTING USERS

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Purpose of Study Wound botulism in injection drug users have been reported. Definitive diagnosis is difficult due to the timing of the testing. If there is high clinical suspicion, a prompt administration of botulism antitoxin heptavalent (BAT) should be considered. Here we are reporting two cases of wound botulism.

Methods Used Retrospective Study.

Summary of Results 29-year-old female with active black tar heroin injection presented to our ED complaining of dysphagia, blurry vision, and generalized weakness. She was found to have healing wounds due to injections, bilateral ptosis, decreased visual acuity, and reduced neck flexion and extension. Given the normal laboratory findings including CBC and CMP, along with normal neuroimaging of the brain and neck, a presumptive diagnosis of wound botulism was established. Patient was administered BAT within 36 hours of admission, discharged on hospital day 11 with significant improvement without requiring mechanical ventilation.

53-year-old Caucasian male with medical history of nasopharyngeal carcinoma diagnosed 3 months prior and poly-substance abuse presented to our ED complaining of bilateral upper extremities weakness, fatigue, and dysphagia. He presented with difficulty walking, talking, and lifting his arms above the shoulder level. Laboratory workup with CBC and CMP were normal. Neuroimaging of brain and spine were unremarkable. Work up for paraneoplastic syndrome dermatomyositis were negative. Clinical diagnosis of wound botulism was made due to presence of healing injection sites of black tar heroin. Patient received BAT on day 5. He required intubations for respiratory failure followed by tracheostomy. He was discharged on hospital day 19 to rehab.

Conclusions Although other conditions such as the Miller Fisher syndrome, Myasthenia gravis, and bilateral or brainstem strokes should be considered, botulism antitoxin heptavalent (BAT) should be administered as soon as possible if the clinical suspicion of botulism is made. The history of drug injection and signs of infection especially around the drug injecting sites further increase the suspicion. The timely administration of BAT can significantly lessen the duration and severity of wound botulism.

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THE FIRST CASE REPORT OF ENDOCARDITIS CAUSED BY SERRATIA FONTICOLA

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Introduction The *Enterobacteriaceae*, *Serratia fonticola*, was first described in 1979 after isolation from freshwater and soil. The first reported infection in humans was isolated from a leg abscess. Human infections typically involve skin and soft tissue, with recent reports of biliary and urinary tract infections. There have not been any associated cardiac manifestations. To the best of our knowledge, we describe the first known case of *S. fonticola* endocarditis.

Case Presentation 59-year-old male with heart failure reduced ejection fraction, atrial fibrillation, and lower extremity venous stasis ulcers with recurrent skin infections presented after ground level fall. He reported deterioration in health for one month with inability to properly care for lower extremity wounds. Physical examination revealed severe lower extremity ulcers with maggots present. X-ray tibia and fibula showed an area of subcutaneous emphysema within the medial aspect of the right calf suspicious for gas-forming organisms. He was admitted to the ICU for treatment of septic shock. He underwent debridement of the lower extremity necrotic ulcers. Hospital course was complicated by elevated troponin for which acute coronary syndrome protocol was administered as well as atrial fibrillation refractory to digoxin. Initially, he received empirical vancomycin and piperacillin-tazobactam while on vasopressors. Blood and wound culture obtained prior to initiation of antibiotics grew *S. fonticola* resistant only to amoxicillin/clavulanate. Vancomycin and piperacillin-tazobactam were discontinued and changed to cefepime to avoid increased incidence of inducible amp-C beta-lactamase production amongst *Serratia* species with use of ceftriaxone. Transesophageal echocardiogram revealed a less than 1 cm mitral valve vegetation. Despite atypical pathogenesis, cultures demonstrated minimal antibiotic resistance and patient was treated with a 6-week course of cefepime.

Discussion Human infections caused by *S. fonticola* are relatively rare. The few cases that have been reported primarily describe skin and soft tissue infections, urosepsis, and biliary tract infection. After a thorough review of the literature, this case appears to be the first description of *S. fonticola* endocarditis.

403 ACUTE SYMPTOMATIC EUVOLEMIC HYPONATREMIA FOLLOWING SARS-COV-2 INFECTION: A CASE STUDY

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Purpose of Study Reports describe COVID-19 patients experiencing a variety of associated syndromes, both during the acute stage or after presumed recovery has begun. We describe a patient diagnosed with COVID-19 who later developed encephalopathy secondary to life-threatening hyponatremia with syndrome of inappropriate antidiuretic hormone secretion (SIADH).

Methods Used Retrospective Case Report

Summary of Results The patient is a 65-year-old Hispanic female with a recent history of symptomatic COVID-19 who presented with altered mental status and an episode of syncope. Four weeks before presentation, the patient developed shortness of breath, cough, fever, diarrhea, and tested positive

for COVID-19. A week before presentation, she had decreased oral intake, diarrhea, and syncope. She was diagnosed at an outside facility with hypovolemic hyponatremia with a serum sodium of 121 mmol/L. After improvement to 129 mmol/L, she was discharged on salt tablets and dexamethasone for COVID-19. The patient was uncompliant with medications and presented to our facility with altered mental status and syncope. Initial labs were significant for sodium of 115 mmol/L. Urine studies were consistent with SIADH. The patient was euvolemic with negative orthostatic vital signs. She was admitted to the ICU and started on 3% NS. Once mentation improved, she was treated with fluid restriction. Other causes of hyponatremia including glucocorticoid deficiency and medications were ruled out. No other explanations for encephalopathy including metabolic, CNS bleed, infarction, infection, or mass were identified. The patient retested positive for COVID-19 with only increased interstitial markings on CXR. Upon discharge, sodium was 132 mmol/L, and mentation improved to her baseline.

Conclusions Through unclear mechanisms, SIADH is associated with a variety of pulmonary diseases. In the literature, SIADH associated with COVID-19 is rare. When hyponatremia is diagnosed, clinicians should be aware of COVID-19 and SIADH as a possible association. This recognition has important implications in patient care and in the research of this novel, unpredictable disease.

404 MYCOBACTERIUM FORTUITUM PYOMYOSITIS AFTER TRAUMATIC LACERATION OF QUADRICEPS

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Purpose of Study Pyomyositis is a rare infection of deep skeletal muscle tissue, pathogenesis not completely understood. Infection of this type by very rare organisms is even less understood. In particular, empiric antibiotic treatment.

Methods Used Retrospective Case Study

Summary of Results A 59-year-old male suffered a traumatic right quadriceps tendon tear secondary to a circular saw accident, for which he subsequently underwent primary repair of right quadriceps tendon and irrigation and debridement of open wound to the right thigh on. Six weeks' post-op, patient noticed swelling and purulent drainage from the surgical wound. Full blood counts showed a white blood cell count of $13.0 \times 10^9/L$ with 91.5% neutrophils. The patient was discharged on Linezolid to treat *Enterococci* and group B *streptococci* with demonstrated sensitivity. Three weeks later at wound clinic, a fluid collection was noted at the surgical site. He underwent incision and drainage three days later. The patient was then admitted and discharged with continuous Zosyn pump infusion to treat *Achromobacter xylosoxidans* with demonstrated sensitivity. He was then followed weekly in outpatient clinic. The wound continued to be erythematous and warm, with occasional purulent discharge. Two weeks later he underwent another incision and drainage, with debridement and removal of non-absorbable sutures, sent for culture and AFB stain. Culture from previous I&D performed 6 weeks' post-op eventually grew rare acid fast bacilli, *Mycobacterium fortuitum*. This bacterium usually demonstrates

sensitivity to Imipenem, Ciprofloxacin, and Sulfonamides. With sensitivities pending, Zosyn was discontinued, and the patient was switched to empiric treatment for *M. fortuitum* comprised of Meropenem, Ciprofloxacin and Bactrim. This treatment regimen perfectly correlated with obtained sensitivities.

Conclusions Pyomyositis can be insidious in onset and undoubtedly missed by unsuspecting physicians. Key factors in treatment include the appropriate antibiotic treatment, incision and drainage, and removal of potentially infected hardware.

405 LEGIONNAIRES DISEASE PRESENTING AS ACUTE KIDNEY INJURY IN THE ABSENCE OF GASTROINTESTINAL SYMPTOMS

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Purpose of Study Legionnaires' disease is a multi-system illness that can negatively affect the pulmonary, renal, GI tract and central nervous system. However, renal insufficiency is relatively uncommon in this condition. This case report presents a patient with acute kidney injury complicating Legionnaires' pneumonia but without the typical gastrointestinal symptoms and hyponatremia.

Methods Used Patient is a 51-year-old homeless Hispanic male with past medical history of Hypertension, systolic heart failure and CKD Stage IV presents with complaints of productive cough worsening for 1 week with yellowish sputum tinged with blood. Labs are significant for acute on chronic kidney injury with BUN 40 and Creatinine 2.98. Chest-X-ray shows right upper lung airspace consolidation representing pneumonia. Patient was started on IV Antibiotics but repeated CXR 2 days later demonstrates worsening of the nodular infiltrate. A follow-up chest CT scan shows a moderate to large sized infiltrate in the right upper lobe with mild mediastinal lymphadenopathy. Urine Legionella Ag came back Positive. Bronchoscopy was performed showing no significant bacterial growth.

Six days after admission, renal function continues to worsen with uptrending BUN and Creatinine values. Acute tubular necrosis was suspected since the patient became oliguric. Renal ultrasound showed no hydronephrosis or obstructive pattern. Vasculitis workup, hepatitis B and C, HIV tests all came back negative. Renal function improved along with respiratory symptoms and patient was able to produce urine appropriately upon discharge.

Summary of Results Physician should consider Legionnaires disease when it comes to pneumonia and concurrent acute kidney injury. This can lead to fewer diagnostic workup and eventually a reduction of hospital costs by avoiding unnecessary tests.

Conclusions Patients with Legionnaires disease might not present with the typical textbook symptoms of GI symptoms and hyponatremia. In addition, concurrent acute on chronic kidney injury makes management very difficult. Considering Legionnaires disease beyond the typical organisms that can cause community acquired pneumonia can prevent invasive diagnostic tests such as bronchoscopy. More research should be done in patients with complicated presentations in order to find related cases and potential treatment options.

406 MANAGING ERYTHRODERMIC PSORIASIS COMPLICATED BY MSSA BACTEREMIA AND INFECTIVE ENDOCARDITIS

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Purpose of Study To share this interesting case with the medical community

Methods Used Retrospective care report

Summary of Results Erythrodermic psoriasis (EP) is a rare, life threatening form of psoriasis characterized by diffuse erythema, scaling and flaking of the skin. This causes a loss of the skin barrier which can make patients more susceptible to infection from common skin flora, such as *Staphylococcus aureus*.

A 57-year-old male with one previous episode of EP who was at baseline until one month prior to presentation when he abruptly began to have a diffuse, erythematous skin rash over his entire body in addition to fevers, chills, and bilateral lower extremity edema. The diffuse rash was described as pruritic and erythematous. Three days after onset, patient also noted pus drainage over the rash along with diffuse, spontaneous sloughing of skin.

Initially he was tachycardic and febrile, and laboratory findings were significant for lactic of 6.2 which cleared after IV crystalloid fluids. Skin biopsies were significant for psoriasis, likely erythrodermic in etiology. Patient was initiated on topical steroids. He was also started on broad spectrum vancomycin and piperacillin-tazobactam to cover for broad spectrum pathogens due to unclear source of infection. Initial blood cultures grew methicillin sensitive *Staphylococcus aureus* (MSSA) therefore antibiotics were changed to intravenous nafcillin. Repeat cultures showed no growth throughout the patient's admission. Trans-esophageal echocardiogram was performed which showed a vegetation along the mitral valve concerning for infective endocarditis secondary to MSSA bacteremia. He was then continued on IV nafcillin 2 gm every four hours for a total of 42 days.

Conclusions In the setting of Erythrodermic Psoriasis, treatment with immunomodulators are known to be first-line to control disease process. Secondary to patient's confounding Infective Endocarditis it was decided to forgo the standard treatment of care. Topical corticosteroids were initiated which resulted in comparable results with significant improvement in erythema, pruritis and flaky skin within six days. We believe initiating treatment using conservative measures prior to aggressive therapy should be considered.

407 FEVER WITH SEIZURES IN AN 8-MONTH-OLD INFANT: A CASE REPORT

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Introduction Herpes simplex encephalitis (HSE) remains one of the life-threatening conditions with high morbidity and mortality despite antiviral therapy. If initiated early, empiric acyclovir therapy can prevent devastating neurological consequences while awaiting diagnostic studies. Diagnosis is mainly made by isolation of HSV DNA polymerase chain reaction

(PCR) from cerebrospinal fluid (CSF). Rash or skin lesions may not be present or reported at initial presentation. We describe a case of an 8-month-old child who presented with fever, seizures with initial negative CSF HSV DNA PCR.

Case Description Child is an 8-month-old previously healthy male infant who presented to our institute with same day history of fever and seizures. Initial laboratory investigations including CSF analysis were normal. Started on intravenous (IV) ceftriaxone and acyclovir. Acyclovir was discontinued once CSF HSV PCR returned negative. Frequent seizure episodes prompted magnetic resonance imaging (MRI) of brain. Imaging showed restricted diffusion in the posterior sylvian cortical areas bilaterally concerning for meningoencephalitis. CSF studies repeated on third day of admission revealed positive HSV DNA PCR. Acyclovir was restarted at 20 mg/kg IV every 8 hours. Parents then reported cold sores in the child one month ago. Child has improved significantly after 12 days of treatment with no recurrence of seizures and has returned to baseline.

Discussion HSE is a rare but devastating disease requiring prompt management with acyclovir. Delayed treatment can result in neurological deficits and/or coma or death. HSV DNA PCR in CSF is the gold standard for diagnosis of HSE. Normal CSF studies have been reported in 5–10% of patients with HSE. Early in the disease course, CSF HSV DNA PCR may be falsely negative. If HSE suspected, and initial CSF studies normal, then our recommendation is to repeat lumbar puncture.

Conclusion This case illustrates the importance of repeat CSF studies in patients with high clinical suspicion of HSE with negative initial results. Caution needed toward discontinuation of acyclovir based on high morbidity and mortality associated with HSE before it is definitively ruled out.

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COCCIDIOSIS HEPATIC ABSCESS IN A PATIENT WITH DISSEMINATED COCCIDIOIDOMYCOSIS: A CASE REPORT

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Purpose of Study Coccidioidomycosis is an infection caused by inhalation of arthroconidia produced by the genus *Coccidioides*. Forty percent of patients develop a self-limited respiratory infection; however, 5% of these individuals develop extrapulmonary dissemination. We present a case of disseminated Coccidioidomycosis, who presented for symptoms of recurrent pneumonia and was found to have a coccidiosis hepatic abscess, a very rare condition.

Methods Used Retrospective case report.

Summary of Results A 50-year-old male with end-stage renal disease on hemodialysis, previously diagnosed with disseminated coccidioidomycosis to CNS and osseous by an outside provider, presented to the ED with intermittent fevers, cough, and dyspnea for 2 months. Labs were significant for leukocytosis with neutrophilic predominance and *Coccidioides* immunodiffusion IgG and IgM assays both reactive with complement fixation titer >1:512. Chest X-ray showed diffuse patchy bilateral airspace disease with consolidation. CT chest revealed similar findings in the lungs; however, an incidental finding of an anterior hepatic septate collection was appreciated. He refused IV Amphotericin due to previous experience leading to his kidney failure. He was started on

empirical IV antibiotics. An abdominal CT was performed and showed a rim-enhancing, septate lesion in the left hepatic lobe measuring 5.4 × 7.3 × 7.3 cm. Percutaneous drainage of this hepatic lesion was performed. Gram stain of the fluid showed multiple spherules resembling *Coccidioides* and no bacteria. Cytology showed spherules with endospores consistent with *Coccidioides*. Culture did not grow any bacteria and IV antibiotics were stopped. His treatment was changed from voriconazole to isavuconazonium and he was discharged with the drainage in place to follow up in the outpatient setting.

Conclusions Liver abscess due to dissemination of coccidioidomycosis is rare. A careful evaluation including a detailed history, physical examination, and radiographic modalities, as well as maintaining a high level of suspicion in endemic areas can aid in establishing the extent of exiting dissemination or finding new foci in previously known cases.

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INTERVIEWING SPANISH SPEAKING PARENTS ABOUT COMMUNICATION IN THE NICU

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Purpose of Study To interview Spanish speaking parents with limited English proficiency (LEP) about their experiences with communication in the NICU. We will 1) explore *from whom and in what manner* they receive information about their baby 2) identify *what* information they receive and *how* this information impacts parental participation in their baby's care, and 3) assess their *satisfaction* with communication in the NICU and *how* they feel communication could improve when preferred languages of the provider and parent differ.

Methods Used We will conduct and audio record 25 in-person interviews of Spanish speaking NICU parents using a semi-structured interview format. Inclusion criteria are parents of newborns admitted to the NICU for at least one week who identify Spanish as their preferred language for communication and who do not identify as English proficient. Five pilot interviews will be conducted to test the interview guide for language, wording, and relevance. All interviews will be audio-taped and transcribed to facilitate analysis. Transcripts will be reviewed for errors by certified bilingual Spanish speakers and then translated to English. A directed content comparison approach will be taken during analysis to identify contextualized segments from each interview that correspond to targeted questions. Newborn demographic data (i.e. birth weight, gestational age, gender), length of stay, medical condition of the infant (i.e. type of respiratory support, IV medication use, major diagnoses), and use of interpretive services will be collected.

Summary of Results We are in the process of conducting 5 pilot interviews. The order, content and number of questions may be adjusted at the end of the pilot process based on parental feedback and interviewer experience.

Conclusions Information gained from parents with limited English proficiency about communication in the NICU may identify ways to improve the care for babies whose parents and neonatal providers prefer different languages.

410 HISTORICAL REVIEW AND RECOMMENDATIONS FOR LYMPHATIC IMAGING IN NOONAN SYNDROME

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Purpose of Study To determine the historical use of various modalities of lymphatic imaging, we performed a comprehensive literature review by collecting the published medical imaging of lymphatic dysplasias in Noonan Syndrome (NS) patients. We correlated imaging findings with clinical phenotypes and outcomes of operative versus non-operative management. Further, our historical review and analysis of lymphatic imaging modalities provides an algorithmic approach to patient care across the spectrum of NS developmental defects.

Methods Used PubMed database searches covered all time periods. Criteria for inclusion in our study included 1) Diagnosis and clinical description of NS and 2) Imaging studies analyzed lymphatic structure, function, or sequelae. We excluded studies featuring ultrasound (US) diagnosis of NS *in utero*. Using these criteria, 19 publications were eligible for inclusion in our review.

Summary of Results A total of 49 NS cases were identified, all since 1975. Clinical manifestations which led to lymphatic imaging included various chylous/non-chylous reflux syndromes (i.e. lymphedema, chylothorax, lymphorrhea, etc.). These complications were evaluated using conventional oil-lymphangiography, lymphangio-scintigraphy (LAS), MR lymphography, chest radiographs, and CT. LAS is currently deemed the 'gold standard' for dynamically screening lymphatic dysfunction. Key imaging findings included varying degrees of central lymphatic blockage, lymphatic collateral formation, and retrograde lymph flow/valvular incompetence. The authors from 8 publications specifically associated these abnormalities and lymphatic obstruction with worse clinical outcomes.

Conclusions Ongoing research continues to fuel the evolution of more effective, less invasive, and less costly methods to dynamically image lymphatic structures and circulation. Our findings support a central role of lymphatic imaging to understand the pleomorphic developmental features of NS and pinpoint potentially remediable lymphatic abnormalities. Advances in lymphatic microsurgery and interventional endovascular radiology enable the enhancement or restoration of normal central lymphatic flow.

411 IMPLEMENTING SCREENING FOR NEONATAL DELIRIUM IN THE NICU AT RADY CHILDREN'S HOSPITAL

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Purpose of Study Delirium is defined as fluctuating changes in awareness and cognition occurring in the setting of a medical illness, and is associated with adverse neurodevelopmental outcomes in pediatric patients. Although delirium is recognized in pediatric ICUs, it is not commonly diagnosed in the neonatal population. The NICU at Rady Children's Hospital is comprised of medically complex patients that are often on multiple medications for pain and sedation, and require prolonged

time on mechanical ventilation. Currently, there is a lack of standardization of prevention, evaluation and management of delirium in the NICU.

Our objective is to increase delirium screening from 0% to 85% in eligible NICU patients by 6/2021. Inclusion criteria are defined as NICU patients > or = 38 weeks corrected gestational age who are mechanically ventilated > 7 days and who are receiving any benzodiazepines or opiates.

Methods Used We plan to use completion of the RASS (Richmond Agitation and Sedation Score) and CAPD (Cornell Assessment of Pediatric Delirium) scores as the objective tool for delirium screening and as our process measure. Secondary process measures will be average benzodiazepine and opioid usage in screened patients. We plan to use any increase in N-PASS scores as a balancing measure. Multiple interdisciplinary meetings were initiated with key stakeholders to develop an algorithm for the evaluation of neonatal delirium. Our current PDSA's include: bedside delirium prevention strategies, appropriate identification and screening of the patient at risk, and creation of a clinical pathway outlining evidence-based strategies for delirium prevention and management.

Summary of Results Because this is a new process, our baseline for screening is 0%, and we will begin screening in 10/2020.

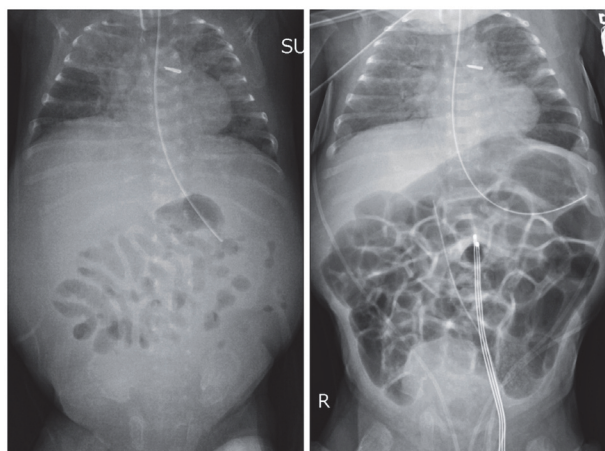
Conclusions Our expectation of this QI project is that early recognition of delirium in our chronic patients will lead to more timely management of symptoms and decreased use of narcotic medications. As therapies develop for more complex diseases, NICUs will see an increase in patients who may suffer from neonatal delirium due to their underlying diagnoses, and it will be important to identify these patients early.

412 USE OF PROPRANOLOL IN TREATMENT OF CHYLOUS EFFUSIONS

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Case Report Chylothorax & chyloperitoneum are rare in infants & challenging to definitively diagnose by current criteria extrapolated from the adult population. They can be of primary or secondary etiologies, including congenital lymphatic malformations & post-operatively following cardiothoracic or abdominal surgery. Current first-line management consists of bowel rest, parenteral nutrition & a modified diet of medium-chain triglycerides but can often take weeks to be effective. Off label use of Octreotide has been reported in numerous case studies for management of chylous effusions, however there is no definitive data available regarding dosing, safety & efficacy for its use in infants. Following acceptance as a treatment for infantile hemangiomas, the novel use of Propranolol for chylous effusions is gaining interest. This case series review describes the use of Propranolol in four infants with chylous effusions; one with congenital pleural effusions & three with post-operative chylothorax & chylous ascites. Clinical improvement was noted within a few days of initiating oral Propranolol & maximum dose used in our cases was 6 mg/kg/day (figure 1). Limited data is available regarding use of Propranolol in infants with chylous effusions with dose used ranging from 0.5–4 mg/kg/day. However, this is the first



Abstract 412 Figure 1 Improvement in chylous ascites with Propranolol

case series reporting its use exclusively in infants with chylothorax & chyloperitoneum. Although further research is needed to establish safety & efficacy, our experience suggests that Propranolol could be a treatment option for chylous effusions in infants.

413 VERTICAL TRANSMISSION OF COVID-19: A LITERATURE REVIEW

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Purpose of Study As the COVID-19 pandemic continues, it is important to understand the ways in which COVID-19 infects vulnerable populations, such as pregnant women and their babies. The objective of this study is to compile the

Abstract 413 Table 1 Studies Investigating Vertical Transmission of COVID-19

| First author, Year published, Location | Mother-Neonate dyads (N) | COVID-19 positive neonates (N)/Total COVID-19 tested neonates (N) | COVID-19 positive neonates (N)/COVID-19 positive mothers (N) | Timing of testing of neonates | Timing of initial positivity for neonates | Clinical outcome in COVID-19 positive neonates |
|--|---------------------------|---|--|---|---|--|
| Zeng, 2020, China | 33 | 3/33 | 3/33 (9%) | Days 2, 4, and 6 or 7 of life | Day 2 of life | Pneumonia, fever |
| Liu, 2020, China | 19 | 0/19 | 0/10 (0%) | Immediately after birth | N/A | N/A |
| Chen, 2020, China | 9 | 0/6 | 0/9 (0%) | Immediately after birth | N/A | N/A |
| Patane, 2020, Italy | 22 | 2/22 | 2/22 (9%) | Immediately after birth for 2 babies, after 24 hours and 7 days for 1 baby, and after 7 days for other baby | 1 neonate positive immediately after birth, another positive on day 7 of life | Mild feeding difficulties |
| Knight, 2020, UK | 259 mothers, 265 neonates | 12/265 | 12/259 (5%) | Variable | 6 tested positive less than 12 hours after birth, 6 tested positive more than 12 hours after birth | 1 neonate admitted to NICU, 2 stillbirths* |
| Zhu, 2020, China | 9 mothers, 10 neonates | 0/9 | 0/9 (0%) | 2 neonates were tested 7 and 9 days after birth. 7 were tested within 72 hours after admission | N/A | N/A |
| Marín Gabriel, 2020, Spain | 42 | 0/42 | 0/42 (0%) | Immediately after birth. Some neonates tested a second or third time within 48 hours after birth | 3 neonates initially tested positive but were re-tested within 24 hours of birth and tested negative, suggesting initial false positives | N/A |
| Zhang, 2020, China | 18 | 0/18 | 0/8 (0%) | Immediately after birth | N/A | N/A |
| Prabhu, 2020, USA | 70 mothers, 73 neonates | 0/71 | 0/70 (0%) | Within 24 hours of birth | N/A | 1 fetal demise at 37 weeks' gestation in a COVID-19 positive asymptomatic mother with poorly controlled diabetes |
| Ferrazzi, 2020, Italy | 42 | 3/42 | 3/42 (7%) | Immediately after birth, days 1 and 3 of life | 2 neonates tested positive on day 3 of life after breastfeeding by COVID-19 positive mother without surgical mask, 1 neonate tested positive on day 3 of life | 1 neonate required admission to NICU and 1 day of mechanical ventilation |
| Yu, 2020, China | 7 | 1/3 | 1/7 (14%) | 36 hours after birth | 36 hours after birth | Mild shortness of breath |

*Not clear if COVID-19 contributed to 2 stillbirths

characteristics and outcomes of neonates born to COVID-19 infected mothers.

Methods Used A literature review was conducted using PubMed and Google Scholar databases. Key search terms included: COVID-19, SARS-CoV-2, coronavirus, vertical transmission, pregnancy, mother-to-child transmission. Studies were included if they had more than 5 mother-neonate dyads and tested mothers and neonates for COVID-19 via PCR.

Summary of Results Eleven studies, published before August 1st, 2020 satisfied our inclusion criteria (see table 1). All mothers were diagnosed during the 3rd trimester of pregnancy or just before giving birth. The timing of testing of the neonates varied by study but in the majority of the positive neonates, the initial positive PCR was within the first 48 hours of life. Studies with larger samples sizes ($n > 20$) showed neonatal positivity rate of 5–9%. Although intra-uterine infection cannot be proven, the timing of positive tests in the neonates suggests vertical transmission either in-utero or during birth. The majority of COVID-19 positive neonates were asymptomatic or had mild symptoms.

Conclusions Our review suggests that vertical transmission of COVID-19 is possible but symptomatic infection is uncommon. Larger prospective studies are needed to establish the relationship between timing of infection in the pregnant mother and various outcomes in the neonate.

414 A CASE OF ROSEOMONAS GILARDII PERITONITIS VIA PERITONEAL DIALYSIS

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Case Report A 73-year-old male with end-stage renal disease on peritoneal dialysis for 3 years presented to the Emergency Department with confusion and cloudy peritoneal dialysate. Vital signs: T 96.6°F, BP 198/84, HR 79, R 17, O₂ sat 96%. Abdomen was soft, non-tender without guarding or rebound. Peritoneal dialysis catheter was present in the left lower quadrant. Exit site was free of erythema or exudate and the tunnel was non-tender to palpation and without fluctuance. Initial laboratories were as follows: Serum: WBC 7.5 $10^9/L$, Hb 9.5 g/dl, Plt 197 $10^9/L$, Na 136 mEq/L, K 5.5 mEq/L, Cl 97 mEq/L, HCO₃ 22 mEq/L, BUN 91 mg/dl, Creatinine 10.1 mg/dl, Glucose 259 mg/dl, Calcium 7.2 mg/dl, Albumin 2.5 g/dl.

On hospital day 1, peritoneal fluid was cloudy revealing: 29 mm^3 RBC, 5243 mm^3 WBC with 86% PMNs and 14% mononuclear cells. Gram stain negative.

Peritoneal dialysis was performed via APD 2L fill of 2.5% dextrose x 4 exchanges over 8 hours with a last fill of icodextran to dwell throughout the day. The patient was started on empiric broad spectrum intraperitoneal antibiotics with ceftazidime 2 g and vancomycin 2 g IP. The ceftazidime was dosed daily on the last fill and the vancomycin was dosed as needed to maintain a serum level between 15–20.

On day 3, peritoneal fluid culture resulted positive 2/2 bottles for *Roseomonas gilardii*. Vancomycin was discontinued and ceftazidime was continued. Peritoneal fluid was sampled again with clear fluid RBC 8 mm^3 , WBC 100, 25% PMN, 58% lymph, 14% mono, 3% eos. Despite the improvement in peritoneal fluid leukocyte count, repeat fluid culture was

persistently positive for *Roseomonas gilardii*. Cirpofloxacin was added.

On day 5, peritoneal fluid showed clear fluid RBC 16 mm^3 , WBC 0, and repeat fluid culture eventually resulted negative.

The patient's confusion gradually cleared and he began to feel better with treatment. Upon later discussion, it was discovered he was having trouble with the plumbing in his house and his toilet had recently overflowed sending water throughout the room in which he performed his PD. Ultimately, he decided to transition to in-center hemodialysis treatments for a period of time to respite from the burden of home PD care.

415 ACYCLOVIR INDUCED ACUTE KIDNEY INJURY WITH PRECIPITATION OF ACYCLOVIR CRYSTALS

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Case Report A 56-year-old male with history of Alzheimer's disease presented with a 5-day history of agitation. Initial lumbar puncture showed a colorless supernatant with an opening pressure of 11 cm H₂O and WBC 63 with a 91% lymphocytosis, RBC of 69, protein of 27 mg/dL and glucose of 54 mg/dL. Initial labs on admission showed a BUN of 11 mg/dL and creatinine of 1.05 mg/dL. He was started on empiric 800 mg IV acyclovir every 8 hours while confirmatory HSV PCR testing on CSF was pending. He began to develop a significant acute kidney injury by day 2 with blood urea nitrogen (BUN) of 24 and creatinine of 4.73 at which time the dose of acyclovir was reduced. By day 3 his BUN up trended to 36 mg/dL and a creatinine of 6.99 mg/dL. Urine sediment showed long needle shaped crystals and rosettes, with bright birefringence under polarized light microscopy (figure 1). By day 6, HSV PCR returned as negative and the acyclovir was



Abstract 415 Figure 1 Acyclovir crystals under polarized light microscopy

discontinued. After stopping Acyclovir his BUN and creatinine returned to baseline of 24 mg/dL and 1.25 mg/dL.

416 RISK OF END STAGE RENAL DISEASE AFTER CHRONIC TESTOSTERONE USE

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Purpose of Study Chronic anabolic androgenic steroid (ASS) use can lead to chronic kidney disease. Given the nature of the irreversible damage, treatment for this condition still requires further research.

Methods Used Retrospective Case Study

Summary of Results We present a case of a 34-year-old male with hypertension diagnosed 3 years ago and history of weekly testosterone injections since the age of 19 who presented with altered mental status and possible seizure. He was in his usual state of health until 2–3 months ago when he began experiencing increased dyspnea, lower extremity cramping, somnolence, fatigue, hypersomnia, polyuria, polydipsia and hyperphagia.

What prompted the patient to the hospital was that while he was sitting on the sofa, his wife noticed that he started gasping for air and shaking his upper and lower extremities. The episode lasted for 2 minutes in which the patient was not opening his eyes or responding. His wife noted that he was not following commands and appeared confused after the episode. Tongue biting was noted, but no loss of bowel/urinary control.

Labs were significant for BUN 167, creatinine 26, bicarbonate 6, calcium 6.4, phosphorus 12.9, and elevated troponin but there was low concern for acute coronary syndrome since troponin leak was attributed to renal failure. Patient received emergent hemodialysis. After 3 rounds of hemodialysis, creatinine dropped to 12.10 with associated hyperphosphatemia and EGFR of 5. Encephalopathy, hypocalcaemia and anion gap metabolic acidosis had resolved. Ultrasound of the kidney revealed increased echogenicity of renal cortex confirming renal failure. Transthoracic echocardiogram demonstrated LVEF of approximately 30%, grade 2 left ventricular diastolic dysfunction, and finding consistent with hypertensive cardiomyopathy. Patient was started on GDMT with Lisinopril and Coreg. Patient was discharged with outpatient hemodialysis 3 times a week. One week later, he presented to the nephrology clinic demonstrating complete resolution of shortness of breath and lower extremity swelling.

Conclusions With a rise in testosterone use, patients need to be educated on the risk of renal failure. Early cessation of AAS is obviously the mainstay treatment of AAS-associated renal toxicity.

417 PEMBROLIZUMAB-INDUCED NEUROMYELITIS OPTICA SPECTRUM DISORDER

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Case Report Neuromyelitis optica spectrum disorder (NMOSD) is a rare, autoimmune disease of the central nervous system, which can present as Longitudinally-Extensive Transverse Myelitis (LETM) and/or optic neuritis. The exact pathophysiology of its autoimmunity is unknown, but autoantibodies against aquaporin 4 (AQP4) have been implicated in the majority of NMOSD cases. Recently, immunotherapy drugs known as programmed cell death protein-1 (PD-1) inhibitors have been associated as a rare cause of NMOSD. PD-1 cell surface proteins downregulate the immune system to prevent autoimmunity. However, this mechanism can also prevent them from attacking cancer cells. PD-1 Inhibitors allow immune cells to remain activated against malignancies, but increase the risk of developing autoimmunity.

Here we present a case of a 50-year-old female with metastatic cervical carcinoma, treated with pembrolizumab, who developed rapidly progressive, bilateral lower extremity, left upper extremity, and left facial paralysis with burning paresthesia, as well as bowel and bladder incontinence, over the course of 72 hours. MRI of the spine, with and without contrast, revealed diffuse signaling and enhancement from the cervicomedullary junction to the end of the thoracic spine (T12) suggestive of acute spinal infarct, transverse myelitis, spinal cord abscess, or malignancy. Diagnosis of NMOSD with LETM was confirmed with positive AQP4 autoantibodies.

Treatment consisted of discontinuation of pembrolizumab, intravenous methylprednisolone for 5 days, prednisone tapered over 6 weeks, and 7 sessions of plasmapheresis, with plans to follow with 1000 mg of rituximab upon discharge, 2 weeks after discharge, and every 6 months thereafter. At the time of discharge, 3 weeks after initiation of symptoms, the patient has shown little response to therapy, with minimal change in paresis.

Upon review of the literature, we have found only one reported case of NMOSD associated with pembrolizumab therapy. Current treatment of NMOSD consists of a combination of IV steroids, plasmapheresis, and IVIG. However, response to treatment varies on a case-by-case basis, and more studies need to be conducted to define the optimal treatment.

418 A CASE OF MARCHIAFAVA-BIGNAMI DISEASE

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10.1136/jim-2021-WRMC.416

Background Marchiafava-Bignami disease (MBD) is characterized by demyelination or necrosis of the corpus callosum, as well as adjacent subcortical white matter. Marchiafava-Bignami disease was first discovered by Italian physicians, Dr. Marchiafava and Dr. Bignami. This is a rare disease is most often observed in malnourished alcoholics. This case demonstrates the nonspecific neurological findings in an individual that fits the demographics most often seen in this disease process.

Case 59-year-old male with past medical history notable for COPD and severe alcohol use disorder for greater than 20 years. Patient was found down and unresponsive by family for an unknown amount of time. His last known normal was estimated to be 2 days prior. Patient was found to have pulmonary emboli and chest X-ray suggestive of pneumonia. He required intubation to due to low GCS. He was started on

anticoagulation, antibiotics and high dose thiamine. Patient's mentation remained obtunded despite sedation holiday. EEG was performed which revealed no seizure activity. He was able to be successfully extubated on hospital day 7. Patient underwent brain MRI which revealed; Nonspecific moderate signal abnormality with mild diffusion restriction in the corpus callosum. Findings were suggestive of a demyelinating process. Upon transfer to the floor, his physical exam was notably for ataxia, dysarthria, and mentation that waxed and waned. Initially, family discussions were held and planned for comfort care. However on hospital day 10 patient regained some mentation unexpectedly and was deemed acceptable for time trial of rehab.

Conclusion MBD is a rare demyelinating disease of the corpus callosum that may result in catastrophic neurological impairment if not recognized and treated early. The differential diagnosis for MBD includes, CVA, neoplastic disease of CNS, progressive multifocal leukoencephalopathy, multiple sclerosis. While its clinical finding maybe nonspecific and mimic many other disease processes. Radiographic findings specific to the corpus callosum allow for the diagnosis to be made accurately. Early treatment with thiamine allows patients the greatest opportunity for neurological improvement and occasional reversal of findings noted on imaging.

419 MODULATION OF FATTY ACID AMIDE HYDROLASE: A VIABLE TREATMENT FOR ALCOHOL USE DISORDER?

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Purpose of Study Research suggests that chronic alcohol exposure induces changes in the endocannabinoid system within the CNS and therefore could be an attractive target for better understanding alcohol use disorder (AUD). Much of this research has focused on the CB1 receptor as it is densely expressed in brain regions involved in addictive behaviors. Recent evidence suggests that chronic alcohol exposure induces changes in the modulation of endocannabinoid concentration, including a partial agonist for the CB1 receptor, anandamide, and these changes may contribute to the motivation to abuse alcohol. Therefore, we performed a literature review to evaluate how fatty acid amide hydrolase (FAAH), an enzyme that degrades anandamide, relates to the characteristics and biology of AUD and how modulating FAAH via pharmacologic inhibition or genetic manipulation effects outcomes related to alcohol use and consumption.

Methods Used We developed a search strategy using the terms 'endocannabinoids' or 'drug delivery systems' and 'alcohol dependence' or 'alcohol use disorder' or 'alcoholism' and 'Fatty Acid Amide Hydrolase', and 'FAAH' as text words and Medical Subject Headings. This search strategy was used on the electronic databases PubMed, Embase, and Web of Science.

Summary of Results We found 224 records; after removing repeated records (37%), articles that did not fit the topic question (47%), or were not primary research (4%), we included 27 for qualitative synthesis (12%). The literature suggests that a missense mutation in the *FAAH* gene, leading to reduced FAAH, is associated with various substance use

disorders. Further, it suggests reduced FAAH may lead to increased intake with reduced sensitivity to alcohol. However, reduced FAAH may also lead to a reduction in reinstatement of alcohol intake and anxiety in withdrawal.

Conclusions The literature clearly suggests FAAH has a role in the biology and characteristics of AUD. FAAH inhibition seems promising as a therapeutic intervention of AUD during withdrawal due to its anxiolytic properties. However, decreased FAAH may also exacerbate some characteristics of AUD outside of that period.

420 ALTERED COPPER NEURONAL TRANSPORT AND ALZHEIMER'S DISEASE

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Purpose of Study Cycling copper (Cu) between monovalent [Cu(I)] and divalent [Cu(II)] states in the brain makes the element potentially neurotoxic, with dysregulated transition metal metabolism promoting reactive oxygen species production. This oxidative stress plays a crucial role in Alzheimer's disease (AD) pathogenesis. We hypothesize apolipoprotein E (APOE)-associated dysregulation of hippocampal Cu metabolism is a key step in AD development, approached via two specific aims: 1) establish the relationship between Cu(I) cation distribution and AD pathology, and 2) study the APOE4-alteration effect on hippocampal synaptic pruning and Cu deposition in the mouse hippocampus.

Methods Used CRISP-17, a fluorescent probe with specificity for monovalent Cu, will visualize Cu distribution in post-mortem human AD hippocampal brain tissue. Cu in isolated synaptosome fractions will be measured using atomic emissions spectroscopy. Cu transport proteins will be downregulated in SH-SY5Y neuroblastoma cells, with resulting Cu deposition and concentration in synaptosomal fractions quantitated with described methods. Synaptic density will be studied in APOE4 knock-in mice and compared with neuroprotective APOE3 knock-in mice using PET scans targeting the SV2A synaptic protein. Mouse brain tissue will be analyzed for Cu(I) with CRISP-17, verifying this relationship in the animal model.

Summary of Results We expect to observe AD hallmarks such as phosphorylated tau and amyloid- β develop in these cells. Cu levels should decrease in synaptic regions of neurons in AD brains compared to non-AD brains. We expect axonal Cu localization in AD brain samples due to copper transport disruption. Synaptic Cu should decrease when at least one copper chaperone is downregulated *in vitro*. We expect to find APOE4 knock-in mice have reduced synaptic density and decreased Cu distribution in the hippocampus compared to APOE3 knock-in mice.

Conclusions This is the first application of this new imaging technique for estimating the role of monovalent copper in oxidative stress, synaptic pruning, and synaptosome function in human and mouse relevant neurodegenerative disease. Combining PET imaging with Cu analysis, we look to establish this method of oxidative stress caused by Cu dysregulation as a possible pathogenesis for AD, a disease not yet fully defined.

421 A RARE PANDYSAUTONOMIC VARIANT OF GUILLAIN-BARRÉ SYNDROME

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10.1136/jim-2021-WRMC.419

Purpose of Study Acute pandysautonomia is a rare disorder characterized by autonomic failure affecting sympathetic, parasympathetic, and enteric functions. We present a unique case, pandysautonomia variant of atypical Guillain-Barré Syndrome in a young, healthy Hispanic female who presented with orthostatic hypotension, gastrointestinal symptoms, bladder dysfunction and sensory demyelination. Our team aims to share this interesting case with the medical community.

Methods Used Retrospective case report

Summary of Results A 21-year-old Hispanic female presented to the emergency department with abdominal pain, diarrhea, nausea, vomiting, anorexia, urinary retention, and ascending weakness for a month. Weakness started at her toes progressing to the mid-thigh level, accompanied with complete loss of sensation in distal extremities. Upper extremity weakness started at the fingers progressing to the elbows. Patient endorsed myalgia in her thighs, upper arms, and lower back, accompanied with light-headedness triggered by standing. IVIG was initiated for GBS without improvement. She received 6 cycles of plasmapheresis, with transient improvement, followed by relapse and worsening symptoms. Another 6 cycles were completed, with moderate improvement. Uniquely, our patient suffered more pronounced autonomic dysfunction, specifically orthostatic hypotension requiring midodrine and fludrocortisone. This patient endorsed persistent nausea and vomiting throughout her admission due to gastroparesis refractory to cholecystectomy, ondansetron, metoclopramide, promethazine, dicyclomine, erythromycin, scopolamine, diphenhydramine, pantoprazole, famotidine, and alum-mag hydroxide-simeth. Failed management led to a trial of pyridostigmine resulting in significant improvement in gastrointestinal symptoms and motor strength leading to the diagnosis of pandysautonomia.

Conclusions Acute pandysautonomia is an uncommon variant of GBS with unclear etiology requiring further research. Encephalopathy, seizure-like activity, mood changes, sympathetic and parasympathetic involvement are components of atypical GBS and warrant an investigation of GBS subtypes. Plasmapheresis is an effective treatment when refractory to IVIG. In our case, pyridostigmine showed significant improvement of our patient's gastrointestinal symptoms.

422 EFFICACY AND SAFETY OF USING EBUS-TBNA IN A RARE CASE OF EPITHELIAL THYMIC CANCER

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Purpose of Study The most common tumors of the anterior mediastinum are thymic tumors and lymphomas. In this case we discuss the use of Endobronchial ultrasound transbronchial needle aspiration (EBUS-TBNA). Comparison of in approaching a mediastinal mass as comparison with mediastinoscopy. Surgical biopsy is considered gold standard for diagnosing mediastinal mass, though is an invasive procedure. EBUS-TBNA is a minimally invasive procedure capable of providing

valuable information for primary tumor diagnosis and mediastinal staging.

Methods Used A 71-year-old male with CKD III, HTN, DM, history of prostate adenocarcinoma and 30-pack-year smoking history. The patient was recently evaluated for new onset hoarseness where he underwent flexible nasopharyngoscopy and was diagnosed with left vocal cord paralysis.

Given the patient's history of prostate cancer and elevated PSA, tobacco use and the unilateral vocal cord paralysis there was a concern for malignancy. MRI of the head, chest and neck, without contrast demonstrated a 7.9 × 5.5 × 6.7 cm mass in the left upper mediastinum. Subsequent PET-CT scan confirmed location of the mass engulfing the great vessels at the level of the aortic arch and thoracic inlet with evidence of Small Bilateral hilar lymphadenopathy.

Due to the multiple comorbidities, encasing mediastinal great vessels making resection is not feasible and the patient preferred less invasive method for diagnosis. Bronchoscopy with EBUS-TBNA technique was performed.

Summary of Results Histopathology demonstrated epithelial thymic cancer.

In our case we were able to provide an accurate diagnosis of thymic carcinoma using EBUS-TBNA, satisfying patient's preference and preventing additional hospital stay or postoperative complications.

Conclusions Different techniques can be used for evaluation of mediastinal mass. Due to its high accuracy and safety, EBUS-TBNA should be considered as a useful technique for the diagnosis of mediastinal masses especially if tumors are not feasible to resection as claimed by imaging. Further randomized controlled studies are required to validate the safety and efficacy of this approach as the first line or standard of care.

423 PULMONARY LANGERHANS' CELL HISTIOCYTOSIS WITH PULMONARY ADENOCARCINOMA AND PULMONARY HYPERTENSION

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Case Report A 55-year-old Caucasian male with a remote history of dengue fever and cutaneous leishmaniasis presented with 6 weeks of progressive dyspnea on exertion. He endorsed sporadic fevers to 38.3 C every few days as well as drenching night sweats, decreased appetite, weight loss, and frontal headaches of 'ice pick' severity. He had a 30-pack year history of tobacco use and quit 20 years ago. He has smoked marijuana for 30 years and denies other drug use. He is a retired carpenter and has asbestos, wood dust, and metal working exposures. He lived in Costa Rica for 25 years and moved to California this month. There were wild parrots around his jungle home. He denies tuberculosis risk factors. He is not taking any medications. He denied a family history of pulmonary disease or cancers. He was found to be hypoxic to 75% on room air that improved to 93% on nasal cannula. He had clubbing and faint expiratory wheezing throughout his lung fields. He had a leukocytosis of 17.7 K/cmm with 17.9% monocytes. Infectious workup was negative. Chest X-ray demonstrated a prominence of the hilum and diffuse cystic lung disease. Chest CT showed mediastinal and hilar lymphadenopathy, an enlarged pulmonary artery, and numerous irregular thin walled cysts, predominantly in the upper and mid lung

zones bilaterally sparing the costophrenic angles. A PET/CT demonstrated PET-avid mediastinal and supraclavicular lymphadenopathy and concern for widely metastatic disease. A supraclavicular lymph node biopsy was performed that demonstrated pulmonary adenocarcinoma (K7+, CK20+, TTF-1+, PD-L1 20%). Alpha-1 antitrypsin level was normal. Echocardiogram showed an elevated right ventricular systolic pressure of 80 mmHg with moderate right ventricular dysfunction. MRI of his head demonstrated a frontal bone lesion. Based on his radiographic imaging and clinical picture he was diagnosed with Pulmonary Langerhans Cell Histiocytosis (PLCH). This patient demonstrated features of extrathoracic involvement given his frontal bone lesion, liver and lymph node involvement. He also had evidence of pulmonary hypertension, which can occur in PLCH from a proliferative vasculopathy involving muscular pulmonary arteries and veins. Given the association with tobacco smoking, adult patients with PLCH are higher risk for lung cancers.

424 REVIEW OF UROLOGIC CHRONIC PELVIC PAIN SYNDROME THERAPEUTIC APPROACHES AND TRANSLATIONAL STUDIES

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Purpose of Study Urologic Chronic Pelvic Pain Syndrome (UCPPS) is a complex disorder characterized by chronic pain originating in the pelvic organs, and significantly impacts quality of life in affected patients. The syndrome occurs in both females and males with an estimated prevalence of up to 26.6% across the world (Tam, Loeb, Grajower, Kim, & Weissbart, 2018). The pathophysiological mechanisms underlying UCPPS are not well understood making it difficult to develop effective therapeutic approaches.

Methods Used The diagnosis of UCPPS is primarily based on the exclusion of other potential causes of chronic pelvic pain, and includes a thorough physical and medical history examination, followed by appropriate selection of first- and second-line therapies. Currently available treatment options include both pharmaceutical and non-pharmaceutical interventions. Treating the symptoms of the condition to improve the quality of life of patients is at the forefront. A comprehensive overview of the published clinical and translational studies summarizing UCPPS pathological mechanisms, treatment options and their efficacies was performed using PubMed.

Summary of Results An accurate diagnosis of UCPPS is critical in order to reduce patient frustration associated with visiting multiple physicians before receiving the final diagnosis. Physicians can utilize the plethora of existing symptoms that are associated with UCPPS alongside a thorough physical examination, history, imaging techniques, and labs in order to reach an accurate diagnosis. First-line treatments for UCPPS can be made more reproducible based off existing data regarding the efficacy of non-pharmaceutical and pharmaceutical interventions.

Conclusions UCPPS is a chronic pelvic pain functional disorder complicated by co-morbid conditions, and is characterized by a plethora of symptoms. If an accurate diagnosis of UCPPS is to be reached, it is imperative that the physicians from multiple disciplines (urologists, urogynecologists, psychologists)

work together with the patient to understand and differentiate UCPPS from other conditions using a patient interview, imaging, and lab tests. Timely diagnosis of UCPPS followed by appropriate first-line treatments can significantly improve quality of life in affected patients.

425 PROSTATE MAGNETIC RESONANCE IMAGING AFTER MINIMALLY INVASIVE PROCEDURES: NORMAL FINDINGS AND COMPLICATIONS

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Purpose of Study Minimally invasive procedures for treating benign prostatic hyperplasia (BPH) and low-risk localized prostate cancer in certain patients have gained popularity because they mitigate the risks of traditional prostate surgery, such as damage to the neurovascular bundle and urethra [1]. Multiparametric magnetic resonance imaging (mpMRI) is the accepted imaging modality for evaluation of the prostate gland and provides both anatomical and functional information [2]. As prostate mpMRI and minimally invasive prostate procedure volumes increase, it is important for radiologists to be familiar with normal post-procedure imaging findings and potential complications.

Methods Used A systematic literature search and review was conducted to assess studies describing prostatic artery embolization, prostatic urethral lift, irreversible electroporation, photodynamic therapy, high intensity focused ultrasound, focal cryotherapy, and focal laser ablation. We examined mpMRI post-procedural cases to demonstrate characteristic findings for presentation and review.

Summary of Results Minimally invasive procedures have advantages over traditional prostatectomy including lower risk of complication, shorter length of hospital stay, and a more favorable safety profile. All of the procedures distort the prostate's appearance with characteristic findings following a specific timeline. Irreversible electroporation may also introduce mpMRI artifacts.

Conclusions Minimally invasive procedures can effectively treat BPH and localized prostate cancers in specific patients with fewer complications than traditional approaches such as prostatectomy. Radiologists reading prostate mpMRI should be familiar with these procedures and their associated complications and post-procedure imaging findings to ensure accurate interpretation.

426 THE USE OF SUBJECTIVE OUTCOME MEASURES IN THE ORTHOPAEDIC SURGERY LITERATURE

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Purpose of Study Outcome measures are of paramount importance in generating high quality evidence across medical literature. However, appropriate outcome measures are far less clear to identify in orthopaedic surgical literature, as it is not uncommon to see subjective outcomes used as surrogates for objective clinical outcomes. The objective of

this study was to conduct a systematic review of the orthopaedic literature to assess the prevalence and frequency of subjective outcome measures used as surrogates for objective outcome measures.

Methods Used A systematic review of orthopaedic literature published in 2018 was conducted. Clinical articles published in the Journal of Bone and Joint Surgery or the Bone & Joint Journal were eligible for inclusion. Basic science articles or case studies were excluded. Data was recorded using Microsoft Excel and classified based on criteria such as article title, article type, year of publication, perceived use of subjective outcomes, primary outcomes, and survival analysis. Keywords used were 'revision surgery', 'need to re-operate', 'infection', and 'complication.' Articles that contained a subjective outcome measure due to pain alone were excluded, as pain is inherently subjective. Two independent reviewers reviewed all article abstracts to determine eligibility for inclusion; a third reviewer resolved disagreements on article inclusion.

Summary of Results Of the 650 articles included in analysis, 184 (28.1%) displayed subjective outcomes including revision surgery, complications, infection, or need for re-operation. Complications (100/184) and infection (98/184) were especially prevalent as subjective outcome measures.

Conclusions A substantial number of articles in the orthopaedic literature use and rely on subjective outcome measures, which can impact study quality and strength of the evidence while creating issues with cross-study comparison or meta-analyses. An increased use of subjective outcome measures also correlates with surgeon decision-making. Steps should be taken to minimize the use of subjective outcome measures as surrogates for objective clinical measures.

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COMPARISON OF RADIATION EXPOSURE BETWEEN FLAT PANEL DETECTOR AND ROUND IMAGE INTENSIFIER C-ARMS

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Purpose of Study Medical radiation exposure is a significant concern for patients and health care workers. During fluoroscopy, flat panel detector systems have claimed to reduce radiation exposure by providing superior image quality at lower radiation doses. This study tested that theory by comparing the cumulative radiation dose between the OEC Elite CMOS Flat Detector (FD) and the conventional OEC 9800 Image Intensifier C-Arm (round) during a simulated right ureteroscopy.

Methods Used In a simulated right ureteroscopy cadaver model, optically stimulated luminescence (OSL) chips were implanted on the anterior kidney capsule, posterior & anterior skin overlying the right kidney, and at the edge of the field of view. 5 trials were performed at 6 different C-arm settings: 1) FD standard fluoroscopy mode with the lowest pulsed setting (4PPS), 2) FD low-dose mode at 4PPS, 3) Round standard fluoroscopy mode with the lowest pulsed setting (1PPS), 4) Round standard fluoroscopy mode at 4PPS, 5) Round low-dose mode at 1PPS, and 6) Round low-dose mode at 4PPS. All trials used 5 minutes of fluoroscopy in 20 second bursts with automatic brightness control. Radiation dose, kVP, and

Abstract 427 Table 1 FD vs. Round C-arm radiation doses

| | Round@1PPS | Round@4PPS | FD@4PPS | p value | P value |
|----------------------|-------------------------------|----------------------------------|---------------------------------|------------------------|------------------------|
| kVP/mA (Low-dose) | 58.4/0.98±0.01 (61/0.42±0.0) | 58.4/0.96±0.03 (60.8/0.41 ±0.01) | 57.6/2.7±0.1 (57.2/0.52 ±0.0) | Round 1PPS vs. FD 4PPS | Round 4PPS vs. FD 4PPS |
| Dose (mR) @Posterior | 415.35 ±12.51 (199.97 ±28.04) | 1225.78 ±48.88 (547.37 ±48.71) | 2305.29 ±141.41 (505.13 ±46.94) | 0.000 (0.000) | 0.000 (0.157) |
| Dose(mR) @Renal | 104.76 ±26.76 (47.63 ±6.02) | 209.39 ±22.31 (130.67 ±18.36) | 453.96 ±55.04 (118.40 ±14.68) | 0.000 (0.000) | 0.000 (0.230) |
| Dose(mR) @Anterior | 63.28 ±3.28 (21.08 ±8.32) | 145.61 ±15.17 (54.80 ±13.85) | 235.08 ±52.04 (41.49 ±12.07) | 0.002 (0.011) | 0.016 (0.106) |
| Dose(mR) @Edge | 19.88 ±2.63 (6.15 ±3.98) | 29.11 ±2.53 (15.47±6.92) | 58.87 ±5.89 (16.98 ±7.15) | 0.000 (0.018) | 0.000 (0.729) |

mA were recorded (table 1). T-tests were used for analysis with p<0.05 considered significant.

Summary of Results Table 1: FD vs. Round C-arm Radiation Doses

Conclusions While modern FD systems claim lower radiation doses, this was not demonstrated in our study. When the FD and round C-arms were compared at the lowest possible pulsed fluoroscopy settings, the FD resulted in 3–4x greater radiation exposure. Round C-arms should be employed when very low doses of radiation are required including when operating on pregnant patients or in children.

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PERIOPERATIVE COMPARTMENT SYNDROME AFTER FREE FLAP RECONSTRUCTION: A CASE REPORT AND LITERATURE REVIEW

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Introduction Upper extremity compartment syndrome (CS) is a devastating complication most often associated with trauma. Few reports exist of CS in the perioperative setting. Given the prolonged duration of complex surgeries, operative positioning can play a major role in ischemic compression. We present a case of forearm CS in a tucked extremity during a free fibula flap.

Methods The hospital course of our patient was retrospectively reviewed, followed by a literature review on postoperative CS. A 34-year-old man, BMI 36 kg/m², underwent resection of mandibular cancer and reconstruction with a free fibula flap from the right lower extremity. The case was 9.5 hours, in supine position. The left arm was abducted on an arm board and the right arm was adducted, palm against thigh and tucked within an arm sled. The following morning, the patient had excruciating right arm pain. The forearm was tense, immobile, and erythematous. A hand surgeon performed

emergent fasciotomies. All muscle groups appeared viable upon decompression. He recovered full right upper extremity sensation and function at 3 months.

Results Literature review revealed an incidence of 0.6 per 100,000 of CS of the hand or forearm requiring fasciotomies in the acute postoperative setting. The majority of patients who developed CS had BMI > 35 kg/m², procedure duration greater than 3 hours, and the affected extremity was often tucked against the patient.

Discussion We believe operative positioning precipitated upper extremity CS in the presented case. Prolonged tucked positioning, obesity, and immobility from anesthesia may contribute to venous obstruction and compromised perfusion. Due to infrequency, surgical personnel may not be vigilant about extremity compression. We recommend untucking when feasible, ranging extremities every few hours intraoperatively, and postoperative monitoring of untouched extremities. CS is clinically diagnosed, and a high index of suspicion must be maintained perioperatively for early recognition and intervention.

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SYSTEMATIC REVIEW AND META-ANALYSIS OF DELAYED VERSUS IMMEDIATE AUTOLOGOUS BREAST RECONSTRUCTION IN THE SETTING OF POST-MASTECTOMY RADIATION THERAPY

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Purpose of Study Breast reconstruction was classically delayed until radiation was complete in breast cancer patients requiring post-mastectomy radiation therapy (PMRT) to optimize outcomes. However, with modern radiation therapy immediate autologous breast reconstruction has increased in popularity in management of patients requiring PMRT. This algorithm minimizes operations needed and alleviates the psychological impact of living without a breast during treatment. The safety and impact of radiation on reconstructed breasts remains to be established. This study aimed to compare immediate versus delayed autologous reconstruction in the setting of PMRT to determine optimal sequencing of reconstruction and radiation.

Methods Used A systematic review of the literature found 292 studies meeting criteria for full-text review and 46 underwent meta-analysis. 2277 immediate reconstruction patients and 1662 delayed reconstruction patients were included. Mean

patient age was 47.6 years. Mean post-operative follow-up was 33.4 months. Early complications analyzed included flap loss, fat necrosis, thrombosis, seroma, hematoma, infection and skin dehiscence. Late complications included fibrosis or contracture, severe asymmetry, hyperpigmentation and decreased flap volume.

Summary of Results Mean complication rates were comparable in delayed versus immediate reconstruction groups respectively, with fat necrosis at 9.89% and 8.12% (p=0.08), flap loss 1.80% and 1.35% (p=0.29), hematoma 14.23% and 7.75% (p=0.39), infection 4.68% and 8.47% (p=0.16) and thrombosis 3.85% and 5.34% (p=0.38). Seroma rates were significantly decreased at 2.49% versus 15.31% (p=0.009).

Conclusions Complication rates are comparable between immediate and delayed breast reconstruction in the setting of PMRT. Given the benefits conferred by immediate reconstruction, immediate autologous breast reconstruction should be considered a viable treatment option in patients requiring PMRT.

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COMPARISON OF TWO DIFFERENT THYROID SLEEVES DURING FLUOROSCOPIC PROCEDURES

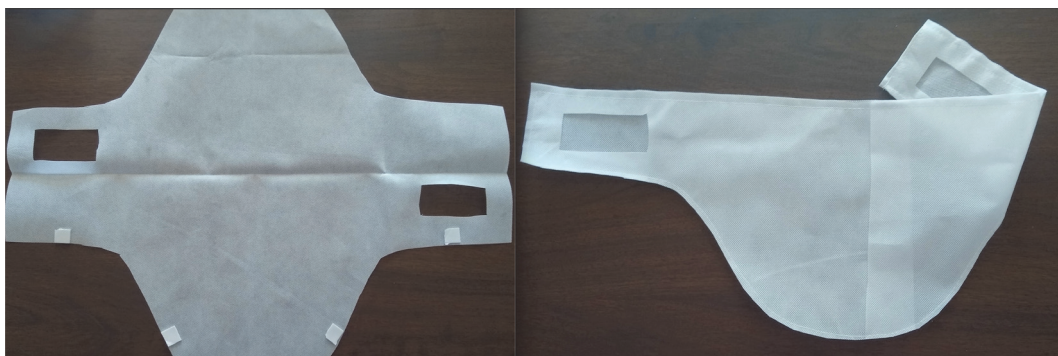
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Purpose of Study Lead garments are commonly used to reduce radiation exposure to healthcare personnel during fluoroscopic procedures. Shared lead garments are known to harbor bacteria and can be a source of intraoperative contamination. Recent studies suggest thyroid shields are omitted partly due to concerns of contamination when shared between multiple individuals. The purpose of this study was to address this concern by designing, creating and comparing two disposable thyroid sleeve covers.

Methods Used Two novel thyroid sleeve covers were designed and produced from non-woven polypropylene material (2.25oz 74 g/m²). Initially, sixteen surgical personnel were asked to complete a questionnaire detailing current lead garment use patterns and concerns. In a prospective, randomized, crossover design, personnel participated in a fluoroscopy case wearing each design and rated their satisfaction with each design using a Likert scale (1–10, 10 being greatest).

Summary of Results Participants included technicians, nurses, advanced practice providers, students, residents, and physicians. Participants rated exposure to body fluids as their



Abstract 430 Figure 1 Design 1 vs 2

greatest concern for the thyroid sleeve, followed by exposure to pathogens, fomites, cleaning protocols, odor, and comfort. The majority of responders indicated contact precautions were 'extremely important' (81%). Both designs were highly rated (9.12 vs 7.89, $p=0.050$, design 2 vs 1, respectively), but responders indicated design 2 was easier to use (8.76 vs 7.94, $p=0.303$), more comfortable (9.24 vs 7.89, $p=0.039$), more protective (9.29 vs 8.11, $p=0.041$), and more durable (8.82 vs 7.94, $p=0.148$). When asked for overall preference, 92% of participants indicated the second design.

Conclusions Providing staff with a functional, disposable sleeve for covering the thyroid shield could prevent exposure and transmission of pathogens between surgical staff and patients. In addition, these protectors could remove a potential reason to avoid thyroid shield use and thereby reduce radiation exposure.

431 HELMETS ON! PREVENTING PEDIATRIC TRAUMATIC BRAIN INJURY THROUGH TEACHING ALL-TERRAIN VEHICLE SAFETY IN ALASKA

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Purpose of Study All-terrain vehicles (ATV) are essential in rural Alaskan communities; however, ATV accidents are among the leading causes of traumatic brain injuries (TBI) in Alaska, with Alaska Native (AN) people experiencing twice the rate of TBI hospitalizations compared to non-Native people. Alaska Trauma Registry data from 2007–2016 demonstrate the highest rates of TBI for AN people occur in the 10–29 age range, their most common cause being ATV incidents. Absence of helmet use has been shown to be a critical factor in the rate and severity of ATV-related TBIs (Rostas et. al, 2014, Mazotas et. al, 2014).

Methods Used In response to TBI injury disparities in AN youth, the Alaska Native Medical Center developed the ATV Safety Toolkit for students in grades 6–12. The toolkit includes five lessons: ATVs and TBIs, Helmet Use, Safe Speed, Driving Under the Influence, and Following Manufacturer's Recommendations. In 2019, the toolkit was piloted in a rural Alaskan school and taught to 55 students in grades 6–12. In 2020, a medical student revised the course to be instructed over five 50-minute sessions and integrated the safety lessons with hands-on science, technology, engineering, and math (STEM) activities. The medical student presented to a focus group of teachers and conducted a feedback survey to evaluate the course content and effectiveness.

Summary of Results This curriculum was evaluated by 12 teachers from four rural Alaskan communities, the majority teaching math or science in grades 6–12. All the teachers strongly agreed or agreed that the course was effective in teaching students about ATV safety and helmet use, that the curriculum was appropriate for rural communities, and that they could teach the course independently. Review of trauma registry data showed no ATV-related injuries from the pilot community in 2019 and one ATV-related injury in 2020.

Conclusions The ATV Safety Toolkit addresses TBI injury disparities in AN youth. This curriculum is designed for rural communities and can be taught by teachers annually to sustain

injury prevention education. Further data will need to be collected on youth helmet use and ATV-related injuries to measure long term outcomes. Future efforts include passing legislation to enforce ATV helmet use state-wide.

432 SEASONAL TRENDS IN OPERATIVE PEDIATRIC SUPRACONDYLAR AND FEMUR FRACTURES AT A PEDIATRIC LEVEL 1 TRAUMA CENTER

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Purpose of Study Supracondylar humerus and femoral shaft fractures are two common injuries managed by pediatric trauma centers. While anecdotally we see an increase in many injuries with warmer weather, no studies in the United States have evaluated this subjective trend. The purpose of this study was to describe the seasonal variation in the incidence of operative pediatric supracondylar humerus and femur fractures, and the relative burden of these injuries on hospital census.

Methods Used We performed an IRB-approved, retrospective review of 1626 supracondylar humerus and 607 femur fractures treated operatively between 2012 and 2018 at a single level 1 pediatric trauma center. Dates of injury were identified as weekday versus weekend, and temperature and precipitation data was obtained through the National Weather Service.

Summary of Results Together, supracondylar humerus and femur fractures account for between 6% and 25% of orthopedic admissions. For every 10 degree (F) increase in temperature, there was a 10% increased likelihood of femur fracture and a 25% increased likelihood of supracondylar humerus fracture ($p=0.03$ and $p\leq 0.0001$ respectively). Femur fractures were less likely to occur on weekdays compared to weekends (OR 0.65, $p=0.0001$) and less likely to occur on days with precipitation (OR 0.39, $p=0.03$), while supracondylar humerus fractures demonstrated no significant weekly or precipitation-related trends.

Conclusions As often anecdotally reported, supracondylar humerus fracture volumes mirror temperature variations annually. Femur fractures appear to have more complex trends, with higher volumes on weekends regardless of season. Geographic variation in temperature, precipitation and proximity to seasonal activities such as snow skiing may contribute to injury volumes.

433 RARE CASE OF INGUINAL HERNIA

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Purpose of Study Inguinal hernia is a protrusion of an organ through the abdominal wall that normally contains it. Amyand's hernia is a rare form of inguinal hernia that contains the vermiform appendix. It has an incidence rate of 1% and 0.1% of these cases will present with a perforated appendix or appendicitis. Inguinal bladder hernia is another rare form of inguinal hernia that contains bladder in hernia

sac. This hernia has been reported to occur in around 1–4% of hernia cases. Inguinal hernia that contains both urinary bladder and vermiform appendix complicated with perforated appendix as seen in our patient has been rarely reported.

Methods Used Retrospective case report.

Summary of the Results A 41-year-old male with a PMH of obesity and alcoholism, and no PSH presented to the ED with complaint of urinary hesitancy, right scrotal pain and edema for 5 days. The physical examination was remarkable for enlarged, tender, erythematous and edematous right scrotum. Lab analysis revealed leukocytosis, hyponatremia, elevated serum creatinine and BUN. Pelvic CT revealed moderate right inguinal hernia with questionable urinary bladder involvement versus abscess formation from the perforated appendicitis.

Initially, laparoscopic approach was chosen, but was converted to open scrotal approach. Intraoperatively, a large herniated mass containing perforated appendix and urinary bladder was appreciated extending into the scrotum. The appendix was removed through open appendectomy. The urinary bladder was repositioned into its anatomical position, and necrotic tissue in the upper scrotum and inguinal canal were debrided. The hernia was repaired without a mesh.

Discussion Most reports encourage a less invasive surgical approach for treatment of Amyand's hernia or inguinal bladder hernia. We were unable to reduce the hernia sac that contained both perforated appendix and urinary bladder through a laparoscopic approach and converted to laparotomy through scrotum. The outcome of our open surgery was similar to reported laparoscopic surgeries as our emphasis was placed on identification of contents of the hernia to avoid surgical bladder or intestine injuries. Mesh was not used in our case due to perforated appendicitis and necrotic scrotal tissue to avoid increased risk of sepsis, and wound infection.

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CHANGES IN TEACHING PERSPECTIVES OF PLASTIC SURGEONS OVER 12 YEARS

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Purpose of Study This study looks at the teaching perspectives of the Vancouver plastic surgery faculty at the University of British Columbia (UBC) using the Teaching Perspectives Inventory (TPI). Data collected in 2019 is compared to TPI data collected in a similar cohort in 2007. As changes to clinical teaching, specifically 'competency by design' (CBD), have recently been introduced, we wanted to explore if teaching perspectives have evolved with changes in program structure and concept.

Methods Used The faculty were asked to voluntarily complete the on-line TPI via email invitation. Each individual sent their TPI report to the primary investigator. Data consisted of the scores for each perspective (Transmission, Apprenticeship, Development, Nurturing and Social Reform) and the concordance scores for Belief, Intention and Action for each perspective. The data sets for 2007 and 2019 were compared and data for faculty in both data sets were analyzed for change.

Summary of Results Apprenticeship was the most common dominant perspective in both cohorts; 7/14 in the 2007 cohort and 8/15 in the 2019 cohort. The mean score for the Apprenticeship perspective increased from 35.8 to 37.2 (out of 45) over the 12 years. The most common recessive perspective was Social Reform with 14/14 in the 2007 cohort and 13/15 in the 2019 cohort. Of the 9 surgeons that completed the TPI in both cohorts, the biggest change was in the Apprenticeship dominant perspective, from 2/9 in 2007 to 5/9 in 2019. The change in score for the Apprenticeship perspective was greater than the change in score for the other four perspectives. One surgeon shifted to Nurturing as their new dominant teaching perspective. Overall there was an increase in concordance for Belief, Intention and Action for all five perspectives.

Conclusions There was no statistically significant difference or change between the TPI results between the 2007 and 2019 cohort. Apprenticeship remains the dominant teaching perspective among UBC plastic surgery faculty and may have become even more dominant among faculty participants who participated in both cohorts. This perspective aligns well with the CBD framework being implemented now in resident education.

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AN ASSESSMENT OF QUALITY OF LIFE FOLLOWING TISSUE EXPANSION IN PEDIATRIC PATIENTS

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Purpose of Study Tissue expansion (TE) is a surgical technique where healthy skin is stretched to create new skin to reconstruct large skin defects. These defects can result from the surgical removal of unfavourable scars or large birthmarks, such as giant congenital melanocytic nevi (GCMN), to improve a patient's functional and/or psychosocial well-being. TE is an intensive procedure with a high rate of complications, and there is a lack of evidence-based information on how it affects a child's quality of life (QOL). This study investigated health-related QOL in children following TE.

Methods Used This prospective study included children who underwent TE at BC Children's Hospital between October 1 2004 and March 15, 2020. To measure QOL, participants completed the Glasgow Children's Benefit Inventory (GCBI), or the Glasgow Benefit Inventory (GBI) for patients who were adults at the time of the study. Total scores range from -100 (worsened QOL) to +100 (improved QOL). Participants were also asked if they would recommend TE to other patients with the same surgical indication.

Summary of Results The response rate was 29% (n=15), including 9 females and 6 males. The most frequent surgical indications were GCMN (33%) and scar (33%). The median total GCBI and GBI scores were 0 (IQR -16 – +47) and 36 (IQR +18 – +61), respectively. 14/15 participants would recommend TE to another child with a similar surgical indication. Participants who saw an overall increase in QOL and would recommend TE (n=9/15) reported increased self-confidence, fitting in with peers, and improved functional outcomes. Participants whose QOL stayed the same or decreased (n=5/15), yet still recommended TE, had scar-

related concerns. One participant, whose QOL decreased, would not recommend TE as they were unhappy with residual scarring.

Conclusions Our study identified a range in QOL outcomes following TE. Despite this finding, the majority of participants would recommend TE to a patient with a similar surgical indication. These preliminary results may help clinicians and patients better understand QOL outcomes in this patient population, and highlights a need for further research.

436 EXPLORING DIGITAL PLATFORMS FOR THE CLEFT-Q: A QUALITATIVE STUDY

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Purpose of Study The CLEFT-Q® is a validated Patient Reported Outcome Measure (PROM) for patients aged 8 to 29y with Cleft Lip and/or Palate (CLP). The e-version of the questionnaire is currently administered using REDCap software, a simple black and white interface. The Tickit platform has been used for other questionnaires and offers animations and colors in the survey design. This study aims to determine if using animations and colors in the presentation of the CLEFT-Q will affect the overall experience of patients answering the questions, and affect their answers. Administering the CLEFT-Q while enhancing patient comfort should allow healthcare providers to collect greater and more accurate data, which is beneficial in the continued effort to understand patient expectations and outcomes.

Methods Used Individuals aged 8–29y with CLP living in British Columbia were invited to complete the same portion of the CLEFT-Q using both REDCap and Tickit. Focus groups or individual interviews were held after completing the questionnaires to obtain participant feedback on their experience. The focus groups/interviews were audio-recorded to analyze feedback. Responses to the questions were compared from one platform to the other, to assess whether survey design affected answers.

Summary of Results 21 of 26 participants preferred completing the CLEFT-Q on Tickit. They felt that the use of colors and animations made the questionnaire less intimidating and more engaging, making it easier to answer emotionally charged questions. They also felt that looking at one question at a time on Tickit allowed them to answer more honestly without comparing answers. Conversely, some participants appreciated the simplicity and efficacy of having all the questions on one page with REDCap. 24% of participant responses for the same question differed from one platform to the other, 54% of which were associated with a more positive response on REDCap.

Conclusions Using different software for the administration of patient reported outcome questionnaires can affect the experience of patients answering questions. Most participants preferred the CLEFT-Q on Tickit, they felt that the layout was more engaging and less intimidating as they answered personal questions. These results support further development and validation of the Tickit version of the CLEFT-Q.

437 SAFE USE OF PERIOPERATIVE CEFAZOLIN IN PATIENTS WITH A HISTORY OF PENICILLIN ALLERGY: A REVIEW

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Purpose of Study Cefazolin (Ancef) is the most frequently prescribed antibiotic for surgical site infection prophylaxis in the perioperative setting. However, many practitioners believe administration of cefazolin is contraindicated in patients with a history of penicillin allergy due to the potential for cross-reaction secondary to the beta-lactam ring common to both molecules. In this literature review, we explore when it is appropriate to use cefazolin in patients with a history of penicillin allergy.

Methods Used PubMed, EMBASE, and SciFinder databases were searched for the chemical structures of clinically relevant beta-lactam antibiotics and studies published from January 2008 – September 2018 describing beta-lactam antibiotic use in patients who reported history of penicillin allergy. ChemDraw version 17.1 was used to qualitatively compare the antibiotic chemical structures in question.

Summary of Results The R1 side chain of penicillin and cefazolin was found to be significantly different. This finding suggests that cefazolin can be administered in select patients with a history of penicillin allergy. We propose recommendations and specific situations where it is appropriate to do so.

Conclusions These guidelines contribute to current antibiotic stewardship practices and address unnecessary substitution of cefazolin for later-generation antibiotics, which are associated with higher costs, increased risk of complications, and the potential for emergence of multidrug resistant organisms.

438 XANTHOGRANULOMATOUS PYELONEPHRITIS CAUSING RENAL-DUODENAL FISTULA

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Purpose of Study An uncommon complication of untreated chronic urinary tract infections or obstructions is xanthogranulomatous pyelonephritis. This study provides the definitive treatment via surgical intervention with nephrectomy.

Methods Used Retrospective Case Study.

Summary of Results The patient is a 72-year-old male with HTN and recurrent nephrolithiasis, brought to the ED due to right flank pain, altered mental status, dyspnea, and fever. Physical examination elicited only right costovertebral tenderness. Laboratory study was significant for anemia, leukocytosis of 22,000, Cr of 1.9, and lactic acid of 2.4. UA revealed pyuria and trace of leukocyte esterase. Zosyn and vancomycin was initiated. Abdominal CT without contrast showed an atrophic right kidney, right renal staghorn calculi, and right hydroureter/hydronephrosis. Interventional radiology recommended placing a nephrostomy tube and stent. Stent placement was unsuccessful due to distal ureter stricture. Urine culture grew *E. coli*, *Enterococcus* spp, and *Candida*; the antibiotics was then changed to amoxicillin/

clavulanic acid and fluconazole for 15 days based on sensitivity. The degree of obstruction was evaluated with antegrade nephrostogram, which revealed aberrant communication between the right-mid ureter and the duodenum, confirmed with repeat CT. The patient was kept NPO, and TPN was initiated. Urology and general surgery were consulted, and a right radical nephrectomy and renal-duodenal fistula repair was initiated. Extensive tissue adhesion was dissected to release the atrophic right kidney while sparing the right adrenal gland. Fistulas were identified, tagged and resected on the proximal ureter and the right renal pelvis. Defects on the duodenum were then approximated and primarily repaired with interrupted Lambert suture. The surgical sample was sent for immunohistological staining, which showed extensive mononuclear cell infiltrate and lipid-laden macrophages, indicative of xanthogranulomatous pyelonephritis. The remaining hospital stay was uncomplicated. He was discharged 9 days post-op and reported no complaints in follow-up.

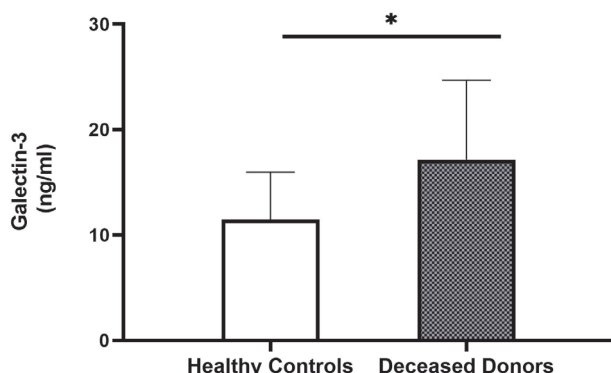
Conclusions Xanthogranulomatous pyelonephritis although rare, can cause fistulas between the kidney and surrounding anatomical structures.

439 DECEASED LIVER DONORS SHOW AN INCREASED LEVEL OF CIRCULATING GALECTIN-3 PRIOR TO LIVER PROCUREMENT

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Purpose of Study An excess of cytokines in liver recipients is known to induce cytotoxic T-lymphocytes and lead to a graft rejection. The contribution of liver donor cytokines in this process is less studied, and may help establish the optimal time frame for liver transplantation and elicit more evidence for targeted anti-inflammatory treatment of liver grafts. Galectin-3 is an endogenous β -galactoside binding lectin that under hypoxic conditions becomes released into the extracellular space and induces the release of pro-inflammatory cytokines. We hypothesize that deceased liver donors have higher levels of Galectin-3 as compared to healthy individuals, which could impact the transplantation outcomes in the recipients.



Abstract 439 Figure 1 Comparison of serum Galectin-3 levels between healthy volunteers (n=10) and deceased donors (n=64)

Methods Used Invitrogen Human Galectin-3 ELISA was used to analyze serum levels of Galectin-3 in healthy donors (n = 10) and deceased liver donors (n = 64) collected immediately prior to graft procurement. Unpaired t-test was performed with GraphPad Prism 7. We used a p-value <0.05 for statistical significance.

Summary of Results Deceased donors had significantly higher levels of serum Galectin-3 (mean 17.17 ng/ml, SD 7.52) in comparison to healthy controls (mean 11.49 ng/ml, SD 4.48).

Conclusions Deceased liver donors show an increase in circulating, extracellular Galectin-3 as compared to healthy controls illustrating the inflammatory processes in liver donors immediately prior to organ procurement. Future studies will characterize the relationship between Galectin-3 levels in the donors and transplantation outcomes in the recipients.

440 AMERICAN COLLEGE OF SURGEONS NEW LEVEL I CHILDREN'S SURGERY CENTER VERIFICATION IMPROVES EFFICIENCY IN TREATING ORTHOPAEDIC TRAUMA PATIENTS WITH FEMUR FRACTURES

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Purpose of Study In 2015, the American College of Surgeons (ACS) created a new hospital designation to improve the efficiency and performance of care in American Children's Hospitals. The Level I Children's Surgery Center (L1 CSC) verification is achieved when a hospital system demonstrates excellence in its infrastructure and operations toward pediatric-specific care. Important elements include 24/7 availability of Pediatric surgical subspecialties, nursing, and Anesthesia teams, access to pediatric beds, quality improvement programs, and hospital quality enhancements. Efficient care of pediatric femur fractures is representative of the highest level of care for pediatric trauma patients. The study was performed at one of six ACS pilot sites for the ACS Level I verification, to determine the designation's effect in improving the efficiency of managing orthopaedic trauma patients.

Methods Used A retrospective analysis of pediatric orthopaedic trauma femur fractures treated at a suburban academic center over two 5-year intervals before (2010–2014) and after (2015–2019) L1 CSC verification. Efficiency parameters, defined as time from admission to surgery, duration of surgery, time from wound closure to OR exit, and duration of hospital stay, were compared between time periods. Welch's t-test was used to compare normative data.

Summary of Results Of 326 traumatic femur fractures analyzed, 122 occurred before the implementation of policies meeting ACS L1 CSC criteria and 204 occurred after – reflecting a 25.16% increase in femur fracture referrals. Patients treated within the first 24 hrs demonstrated a decrease in mean wait time from admission to surgery, 13.73 hrs before; 11.09 hrs after (p<0.01), and duration of hospital stay, 100.55 hrs before; 71.44 hrs after (p<0.01). There was no significant change in duration of surgery, 1.84 hrs before; 1.75 hrs after (p=0.47), or elapsed time from surgery closure to OR exit, 0.24 hrs before; 0.24 hrs after (p=0.94).

Conclusions Implementing hospital infrastructure and policies requisite for ACS L1 CSC certification is associated with increased efficiency in treating Pediatric trauma patients by

decreasing the time elapsed from ED admission to surgery start time and overall time of hospitalization.

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IMPROVED EFFICIENCY IN TREATING ORTHOPAEDIC TRAUMA PATIENTS WITH SUPRACONDYLAR ELBOW FRACTURES AFTER AMERICAN COLLEGE OF SURGEONS LEVEL I CHILDREN'S SURGERY CENTER VERIFICATION

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Purpose of Study In 2015, the American College of Surgeons (ACS) created a new hospital designation to improve the efficiency and performance of care in American Children's Hospitals. The Level I Children's Surgery Center (L1 CSC) verification is achieved when a hospital system demonstrates excellence in its infrastructure and operations toward pediatric-specific care. Important elements include 24/7 availability of Pediatric surgical subspecialties, nursing, and Anesthesia teams, access to pediatric beds, quality improvement programs, and hospital quality enhancements. Efficient care of pediatric urgent supracondylar elbow fractures is representative of the highest level of care for pediatric trauma patients. The study was performed at 1 of 6 ACS pilot sites for the ACS Level I verification, to determine the designation's effect in improving the efficiency of managing orthopaedic trauma patients.

Methods Used A retrospective analysis of pediatric orthopaedic traumatic supracondylar fractures treated at an academic center over two 5-year intervals before (2010–2014) and after (2015–2019) L1 CSC verification. Efficiency parameters, defined as time from admission to surgery, duration of surgery, time from wound closure to OR exit, and length of hospital stay, were compared between time periods. Welch's t-test was used to compare normative data.

Summary of Results Of 754 traumatic supracondylar fractures analyzed, 205 occurred before the implementation of policies meeting ACS L1 CSC criteria and 549 occurred after – reflecting a 45.62% increase in supracondylar fracture referrals. Patients treated within the first 24 hrs demonstrated a decrease in mean wait time from admission to surgery, 10.37 hrs before; 8.71 hrs after ($p < 0.01$), and duration of hospital stay, 33.89 hrs before; 21.68 hrs after ($p < 0.01$). There was no significant change in duration of surgery, 0.97 hrs before; 0.93 hrs after ($p = 0.49$), or elapsed time from surgery closure to OR exit, 0.22 hrs before; 0.20 hrs after ($p = 0.10$).

Conclusions Implementing hospital infrastructure and policies requisite for ACS L1 CSC verification is associated with increased efficiency in treating Pediatric trauma patients by decreasing the time elapsed from ED admission to surgery and total time of hospitalization.

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SINGLE SITE VIDEO ASSISTED THORACOSCOPIC BLEBECTOMY FOR SPONTANEOUS PNEUMOTHORAX IN A TEENAGER

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Purpose Surgical treatment for pediatric spontaneous pneumothorax has evolved from open thoracotomy to multiport

Video Assisted Thoracoscopic Surgery (VATS). A 16 year-old male with a one-week history of right upper back pain who was found to have a large right-sided spontaneous pneumothorax. Conservative management was attempted, but failed, and he was scheduled for right apical lung blebectomy and mechanical pleurodesis. The decision was made to use a single site approach to minimize sequelae of the surgery.

Methods Used Conservative management with chest tube suction was deemed unsuccessful on hospital day five. He was taken to the operating room for a single site VATS with blebectomy and mechanical pleurodesis procedure. The patient was brought to the operating room and a double lumen endotracheal tube was placed for general anesthesia, with single lung ventilation initiated after positioning. The chest tube was removed and the chest tube incision was enlarged slightly to accommodate for the width of the operating surgeon's index finger. The thoracic cavity was entered and a GelPoint Mini (Applied Medical) containing one 12 mm trocar and two 5 mm trocars were placed. Right apical blebs were resected using a 45 mm purple load endoGIA stapler. Mechanical pleurodesis was performed using cautery scratch pad. A #20 French chest tube was placed after gelpport, through the same incision site. The chest wall fascia and skin were closed around the chest tube. Operative time was 64 minutes.

Summary of Results His postoperative course was complicated by a minor air leak that sealed by postoperative day five and he was discharged home. The patient was seen at 6-weeks post operation with an excellent cosmetic result.

Conclusions Similarly to the rise VATS during the thoracotomy era, single site VATS may become more popular in the pediatric population. This adds to the growing clinical evidence that the single site approach has improved postsurgical outcomes.

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AIRWAY MANAGEMENT WITH SEVERE LINGUAL SWELLING: A SYSTEMATIC REVIEW OF THE LITERATURE

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10.1136/jim-2021-WRMC.441

Purpose of Study The most recent Advanced Trauma Life Support manual from the American College of Surgeons describes how a cricothyrotomy is preferable to a tracheostomy. This recommendation is based on cricothyrotomy's being associated with less bleeding, less time in surgery, and less early and late complications. However, despite this recommendation, studies have found a high degree of preference for tracheostomy's over cricothyrotomy's in emergent settings, such as in severe lingual enlargement.

Methods Used A systematic review of the literature on airway management with severe lingual swelling was conducted. Full-length articles available in English on PubMed and/or Embase that covered case(s) related to active lingual hematomas and their outcomes were included in the final analysis. In addition to 10 eligible articles found on PubMed and Embase, two additional articles, which did not appear with the specified search parameters, were included from the citations of a 2001 review on the topic.

Summary of Results Of the final 12 articles analyzed, six depicted patients that underwent a surgical tracheostomy. The systematic review revealed no cases in which a patient underwent a surgical cricothyrotomy.

Conclusions A cricothyrotomy is the intervention of choice for patients that cannot be intubated or ventilated, but studies, including this systematic review, show that it is not routinely performed. This may be explained by the belief that for long-term use, cricothyrotomies need to be converted to tracheostomies to avoid subglottic stenosis. This assumption is primarily based on literature that was published over 80 years ago.

Despite a recent article in the Journal of the American Medical Association, which found that there were no benefits associated with converting a cricothyrotomy to a tracheostomy, this assumption persists. Further research is needed to assess the factors influencing clinician procedure preferences, including continuing medical education, to ensure optimal, evidence-based practices.