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Developing evidence-based tools from EHR data

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Early in our nursing school journey, we all faced the daunting task of learning how to document patient care. We learned that documentation is important for team communication and serves as a legal document if needed. Despite these important functions, documentation is often seen by nurses as a required, yet time-consuming, task that isn't generally a highly valued part of patient care. Nurses would much rather spend time with their patients. However, with the advent of the electronic health record (EHR), documentation has taken on a new meaning and holds extended value. Data, documented by the clinical team and retrieved electronically, provide the content for quality measurement and research.

As more evidence-based assessment tools are translated into practice, nurse managers and their staff members are uniquely positioned to lead or join the effort to make a difference with nursing documentation and EHR design. We have an opportunity to leverage the daily task of documentation into an activity that yields valuable practice evidence, decision support, and communication tools. As an example, our research team is using nursing documentation to build decision support for an important and common process—discharge planning and care coordination.

With our 20-year history of using EHR data to build decision support for discharge referral decision making, our story yields valuable insights and lessons learned for nurse managers looking to leverage the EHR to derive evidence-based tools and position nurses to make a difference through documentation.

From EHR to decision

The nursing admission assessment is a common example of nursing documentation. It occurs upon admission for every admitted patient regardless of setting, but it's quite extensive in acute and home care. Nurses spend 20 minutes to 1 hour or more asking questions, completing assessments, and documenting their findings in the process of admission. However, this rich data source is much underused and stands as an example of how nursing can lead the way in leveraging EHR data to improve care.

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Lessons learned during our research include avoiding missing data, making nurses aware of the importance of documentation as a data source, adopting the use of evidence-based tools, avoiding customization, and seeking ways to use nursing documentation for research and quality measurement.

Avoid missing data

Often, the patient is unable to answer our questions or we're too busy to complete our assessments fully. It's important to earmark these documents for later completion with the patient or caregiver to avoid missing data. A design recommendation is that the software should flag the missing data so clinicians can easily see what to complete. A common example that we often see is patients with mobility or toileting deficits marked as "requires an assistive device" but the equipment needed is missing. This is important information because knowing what equipment the patient uses or needs completes the picture of this patient's functional status and supports care planning.

Make nurses aware of the importance of documentation as a data source

Busy nurses are often unaware that their documentation is used for other purposes, such as research or quality measurement, and how they document affects the ability to retrieve data. Free text data are difficult to retrieve and require natural language processing or coding to make them useful. In our research, we saw instances of free text used in place of standard electronic choices, even when the choice was available. Perhaps it's time saving to quickly type in a word rather than look for the appropriate answer. However, this simple action results in much labor to clean and categorize the responses to use the data. If the pick list choice offers "wheelchair" but the nurse types in "Wheelchair or Wheel chair," these return as three separate responses in a database table and have to be re-coded and merged. It's important to raise awareness of this issue so data can be mined more effectively.

Adopt the use of evidence-based tools

To support our ability to compare patient data and outcomes nationally and internationally, nursing should adopt standardized terms and evidence-based assessment instruments. For example, a nationally derived, standardized e-measure for pressure ulcers is near completion. Adoption of such standard measures decreases variation in data and supports the formation of large datasets useful for data mining and knowledge discovery. As nurses, we have an opportunity to promote patient data that are useful during the care we provide and for measuring the outcomes we achieve.

Avoid customization

We all have our favorite ways to document care or favor certain data elements over others. However, making changes to the data fields of the EHR to customize the content defeats the purpose of standard measures. In our research, we merged data from four hospitals that all had the same EHR.¹ However, we had major difficulties with these merges because each of the four sites had customized the pick list choices or reworded the questions. One serious example was when the stem of a question was changed to be the opposite of what was intended. Three sites kept the stem as, "The patient is oriented to..." but the fourth site

changed it to read, “The patient is disoriented to...” while keeping the same pick list choices. Although the answers remained the same, the question meant something very different and doing quality improvement or research using this data field could result in serious misinterpretation. Nurse managers should create an infrastructure that carefully vets any changes made to the standard EHR content to avoid making such errors. In addition, if you must make changes, consult with the vendor or other users of the same EHR nationwide before making changes.

Seek ways to use nursing documentation for research and quality measurement

Despite the challenges described above, our team uses nursing documentation to build decision support and imbeds our resulting product in the hospital EHR within the nursing admission assessment. Our work began when we discovered a clinical problem that at-risk, hospitalized older adults weren't being referred for postacute care, such as home care, as expected. We learned that the information needed for decision making was scattered throughout the medical record and not available in a summary form. Nurses collected most of the data during the admission assessment and continued documentation, but the data weren't summarized or accessed by discharge planners in a systematic way.

Through accurate, thorough electronic documentation, we have an opportunity to make a difference in research and practice toward achieving improved patient outcomes.

Data to the rescue

Our team created case studies from the data and presented them to experts in discharge planning for evaluation of postacute referral need.^{2,3} Experts were able to identify 26 characteristics of patients (documented mainly by nurses) that are important to consider when making referral decisions. Through statistical modeling, a six-item risk-screening tool emerged, which provides advice to busy discharge planners about patients who are at risk for poor discharge outcomes and may benefit from postacute care. This advice helps discharge planners prioritize their care planning and alerts them so that no high-risk patients are missed. Completed upon admission, it gives the team more time to create the discharge plan. In two recent studies, when this tool was used to support referral decision making, 30-day readmissions declined by 26% and 35%.^{4,5}

In our current NIH-funded study (2RO1NR007674), we combined nursing documentation from the nursing admission assessment with daily documentation captured 24 hours before discharge to form case studies for our second-generation decision-support tool. The new tool will not only identify high-risk patients in need of postacute care, but it will also recommend the optimal level of care, such as home care, hospice, skilled nursing facility, inpatient rehabilitation, or long-term care facility. Our work is an example of the value and richness of nursing documentation and what useful applications we can build from the data. Thanks to nursing assessment and documentation, we have data on over 60 variables, such as cognition, activities of daily living, caregiver support, home environment, health history, symptom status, medication issues, wounds, incisions, and emotional status.

Making a difference

The depth and breadth of nursing documentation is an underused resource, and nurses are encouraged to use these data to create new knowledge. Nurses must no longer see documentation as a chore or mere necessity. We must embrace our role in designing information systems that generate data used in deriving evidence-based tools that support practice and process improvement. The intimate questions asked by nurses of patients and their caregivers provide a robust picture of patient health needs that's useful beyond the medical diagnoses, medications, and administrative data previously used to support decision making or make predictions. Through accurate, thorough electronic documentation, we have an opportunity to apply our holistic approach to patient care and make a difference in research and practice toward achieving improved patient outcomes.

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