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### RESEARCH ARTICLE

## CONTRIBUTION OF GREEK MYTHOLOGY AND CIVILIZATION ON MEDICAL SCIENCE- A BRIEF ANALYSIS.

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### Abstract

Ancient Greek civilization is one of the oldest civilizations in the history of time. Present modern civilization is grateful to Greek contribution in different sector especially in medical science. Their mythology and knowledge of medical practice keep profound contribution to medical science e.g. Rod of Hermes or Caduceus (the rod has two snakes entwined in opposite directions) have adopted by US Army Medical corps and several medical organization throughout the world which represent healing, wisdom and rejuvenation. Rod of Asclepius is the logo of the World Health Organization, American Medical Association, Emergency medical care where the snake and staff in the center of the symbol etc. Similarly the word Hygiene came from Hygieia who was a Greek goddess of health and associated with the prevention of sickness and the continuation of good health. The bowl of Hygieia, a bowl with serpent entwined is the symbol of Pharmacy. The goddess Panacea was said to have a poultice or potion which brought about the concept of the Panacea in medicine. Hippocrates is associated with two historical titles: the father of medicine and the Hippocratic Oath. The Hippocratic Oath is an oath historically taken by doctors swearing to practice medicine ethically. Aristotelian virtue theory provides a practice-based focus for health care and

Pythagorean Theorem is widely used in medical imaging. Galen is best known as the most influential exponent of the ancient world's cumbersome medical doctrines—especially humoral theory and for many subtle anatomical discoveries.

In this paper, a brief history, mythology and contribution of Greek civilization have been discussed for students, researchers as well as philosopher to further learning and implementing to their respective fields.

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**Introduction:-**

Greek medicine derived its earliest beliefs and practices from Egypt and West Asia. Greek medicine later spread around the Mediterranean during Roman times and was to form the basis of the medical knowledge of Medieval Europe. Our knowledge of Greek medicine mainly comes from the Hippocratic writings and from Galen writing in the second century CE. The earliest Greek medicine was based on religion. Asclepius, the son of Apollo, was able to cure disease and patients sleeping at his shrines would see the God in their dreams and receive advice on appropriate treatments. Around the sixth century BCE Greek medicine began to change with a greater emphasis on rational explanations of disease involving natural rather than supernatural causes. The Hippocratic writings, probably written by a number of authors, suggested liquids were the vital element in all living things. The human body contained four fluids or humors, phlegm, yellow bile, black bile and blood. Disease was caused by an imbalance of these fluids in the body. Such an imbalance could be caused by the weather or by extreme behavior such as over eating or excessive drinking. The medical practice of bleeding, which was to persist for several thousand years, originated from the belief there was an excess of blood which could be cured by releasing some blood from the body. Correct diet, bathing, exercise, sleep and sex would prevent illness. According to Hippocrates sex should be more frequent in winter and older men should have sex more frequently than younger men. He considered epilepsy was caused by an excess of phlegm. Hippocrates however tells us little about infectious diseases and anatomy as the dissection of bodies was taboo as it was considered to be a violation of the sanctity of the human body. (Forrester, 2016)

In ancient Greek medicine illness was initially regarded as a divine punishment and healing as, quite literally, a gift from the gods. However, by the 5th century BCE, there were attempts to identify the material causes for illnesses rather than spiritual ones and this led to a move away from superstition towards scientific enquiry, although, in reality, the two would never be wholly separated. Greek medical practitioners, then, began to take a greater interest in the body itself and to explore the connection between cause and effect, the relation of symptoms to the illness itself and the success or failure of various treatments. (Cartwright, 2018).

Greek Medicine is the traditional, indigenous holistic healing system of Western civilization. It was first codified and systematized by the Greek philosopher - physician Hippocrates in the 4th century B.C.E. and subsequently developed and expanded by other physicians, most notably Galen, Dioscorides and Avicenna. In the Islamic world, Greek Medicine is known as Unani Medicine or Unani Tibb. "Unani" is the Arabic word for "Ionian", or Greek. Greek Medicine was the original source and inspiration for many other natural, holistic and alternative medical systems that developed in Europe and the United States in the 18th and 19th centuries, which include homeopathy, naturopathy and chiropractic. The exemplary life and teachings of its founder, Hippocrates has provided a shining source of inspiration to natural healers down through the ages. (Greek medicine, 2018)

**Some mythology and contributions of Greek civilization are:****Rod of Hermes- Caduceus**

Hermes, the messenger of Gods (Mercury) on mount Olympus, had a magic wand called Caduceus. The rod has two snakes entwined in opposite directions, with their heads facing each other. Snakes moving about without any visible means of support or locomotion were considered to be the wisest and cleverest of all animals by ancient Greeks and Romans It is said that Hermes found two snakes fighting, when he placed his rod in the middle and snakes entwined the rod establishing peace (Pai-Dhungat, 2017).



The caduceus or the staff of Hermes, depicted as a stick entwined by two snakes and surmounted wings is the symbol of modern medicine in India and elsewhere. Most major hospitals, medical colleges, clinics, professional bodies, prescriptions and medical journals support this symbol either as an emblem or as part of their logo. The car windshields of many doctors feature this symbol prominently as a badge of prestige and honor. But unfortunately,

the very emblem we flaunt as an insignia of our profession is a false symbol and has nothing or very little to do with the noble art of healing. The true and authentic symbol of Medicine is not the Caduceus but the Rod of Asclepius (Bohigian, 1997).

In classical mythology Hermes is described as the messenger of the gods, a diplomat and a mediator, but also as a patron god of thieves and treachery. He is the self-interested god of trade and wealth and a patron of merchants (Harris and Platzner, 1995).

The first references to the caduceus as a medical symbol can be traced to the middle of the 16th century and it has been suggested that since alchemy and medicine were closely linked at that time, the caduceus became inadvertently associated with the medical profession (Blayney, 2004).

Perhaps the most important event uniting the caduceus with medicine came in 1902, when the US Army Medical Corps adopted the symbol. This espousal was based in part on an erroneous claim that the symbol was used by the medical corps of France, England and Germany, when in fact these units used the Aesculapian staff instead (Friedlander, 1992).

Probably because of the initial mistake of US Army Medical Corps, several medical organizations throughout the world have adopted the double-snake symbol to represent healing, wisdom, and rejuvenation. According to a 1992 survey in the US, only 62% of professional medical organizations used the rod of Asclepius, whereas 76% of commercial organizations used the caduceus (Friedlander, 1992).

### **Rod of Aesculapius**

Asclepius was the son of the god Apollo and the mortal woman Coronis. Apollo was a handsome (even beautiful) beardless youth (Kouros), the son of Zeus and one of the most important of the twelve Olympian deities, who had many attributes. He had many lovers, both male and female, several of whom were mortal humans, but most of his love affairs had tragic outcomes, as did his affair with Coronis (Nayernouri, 2010).

The symbol of the International Committee of the Red Cross is a red cross on a white background, this symbol was adopted at the Geneva convention in 1864, this was done mainly to protect medical vehicles and buildings from any military attack during a conflict but this symbol is often mistakenly used to sometimes indicate first aid stations and medical supplies (Stahel, 2013).

The Asclepian snake is described as watchful, gentle, and endowed with perennial youth through the shedding of its skin, hence its association with healing. (Kellie, 1999)

The Aesculapian staff consists of a single snake wound around a knotty branch. Aesculapius is said to have acquired this emblem when he killed a snake that coiled around his staff, but was soon confronted by another snake carrying a magic herb that restored life to its companion (Compton, 2002).



Rod of Aesculapius is the single serpent-entwined staff of Aesculapius (Latin, Aesculapius, Roman, Aesculapius, Greek, Asclepius) the ancient Greco-Roman god of medicine (Nayernouri, 2010).

### Hygieia

In Greek as well as Roman mythology, Hygieia was one of the Aeclepiadae; the sons and daughters of the god of medicine, Asclepius, and the goddess of healing, Epione. She was the goddess/personification of health, cleanliness and hygiene. Hygieia also played an important part in her father's cult. While her father was more directly associated with healing, she was associated with the prevention of sickness and the continuation of good health. Her name is the source of the word "hygiene". She was imported by the Romans as the goddess Valetudo, the goddess of personal health (Wikipedia, 2018).



Hygieia was ancient Greek goddess of health. She gave her name to the philosophy of hygiene. The young goddess was daughter and chief attendant to Asclepius, the God of medicine. She was in charge of cleanliness and teaching how to live a long life (preventive medicine). Her two known sisters were Panacea ("cure all") and Laso (Remedy) Cult of Hygieia started in Epidaurus (600s BC). Statue of Hygieia and Athena stood at the entrance of Acropolis temple (Pai-Dhungat, 2017).

### Bowl of Hygieia

The Bowl of Hygieia, a bowl with serpent entwined has become international symbol of pharmacy, like staff of Asclepius is for medicine. The common attribute of healing deities is serpent with its connotations of healing, immortality and longevity (Pai-Dhungat, 2017).

As a goddess Hygieia obtained a major role in the cult of Asklepios in Athens and in her own cult, which already existed before the coming to Athens in 420 BC. Fore mostly as his wife, she accompanied Asklepios on many locations through-out the Greco-Roman world. Due to her preventive function and the need for a divine family, Hygieia is the most important healing deity in Greek religion. As Athena Hygieia she protects mental and physical health with numerous counterparts in the ancient world (Beumer, 2015).



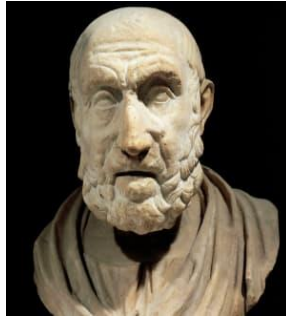
### Panacea

In Greek mythology, Panacea was a goddess of universal remedy. She was the daughter of Asclepius and Epione. Panacea may have been an independent goddess before being absorbed into the Asclepius myth. Panacea was said to have a poultice or potion with which she healed the sick. This brought about the concept of the panacea in medicine, a substance meant to cure all diseases. The term is also used figuratively as something intended to completely solve a large, multi-faceted problem (Wikipedia, 2018).



## Hippocrates

The last quarter of the fifth century and the beginning of the fourth century BC saw the births of philosophy and medicine in Europe. While the written history of reason can be attributed to Plato (428-347 BC), the start of European medicine is identified with Hippocrates (460-377 BC). Distinguishing the latter is the fact that he resolutely wrote on medicine as such. In this period of time, both philosophy and medicine are understood and presented as art, that is to say 'techne' in ancient Greek. While philosophy deals with the soul, medicine concerns itself with the health of the body (Zahir, 2016).

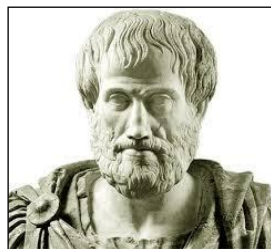


As a physician, Hippocrates is associated with two historical titles: the father of medicine (iatrike) and the Hippocratic Oath. The first title indicates that with Hippocrates the techne of iatrike has shifted from a divine explanation of disease to a rational and 'physiological' understanding of its development. The second title relates to a short text, written by Hippocrates and in which he declares, 'I swear by Apollo Physician, by Asclepius, by Health, by Panacea and by all the gods and goddesses, making them my witnesses, that I will carry out, according to my ability and judgment, this oath and this indenture ...' (Jones, 1995).

The Hippocratic Oath is an oath historically taken by doctors swearing to practice medicine ethically. It is widely believed to have been written by Hippocrates, often regarded as the father of western medicine, in Ionic Greek (late 5th century BC) (Edelstein, 1943).

Hippocrates was born around 460 BC on the island of Kos, Greece. He became known as the founder of medicine and was regarded as the greatest physician of his time. He based his medical practice on observations and on the study of the human body. He held the belief that illness had a physical and a rational explanation. He rejected the views of his time that considered illness to be caused by superstitions and by possession of evil spirits and disfavor of the gods (Kosisland, 2018).

Hippocrates of Kos (460-377 Before Common Era, BCE) is universally recognized as the father of modern medicine, which is based on observation of clinical signs and rational conclusions, and does not rely on religious or magical beliefs. Hippocratic medicine was influenced by the Pythagorean theory that Nature was made of four elements (water, earth, wind and fire), and therefore, in an analogous way, the body consisted of four fluids or 'humors' (black bile, yellow bile, phlegm and blood). The physician had to reinstate the healthy balance of these humors by facilitating the healing work of 'benevolent Nature'. The Hippocratic Oath contains the Pythagorean duties of justice, secrecy, respect for teachers and solidarity with peers. The clinical and ethical basics of medical practice as well as most clinical terms used even today have their origins in Hippocrates. His contribution in clinical medicine is immense (Yapijakis, 2009).



Aristotelian virtue theory provides a practice-based focus for health care ethics for a number of reasons. Also, because of his emphasis on the character of the moral agent, and on the importance of perception and emotion in

moral decision-making, Aristotelian virtue theory provides a useful supplement to the traditional duty-based approaches to health care ethics analysis, which are increasingly being identified in the literature as having limits to their application within the health care context (Scott, 1995).

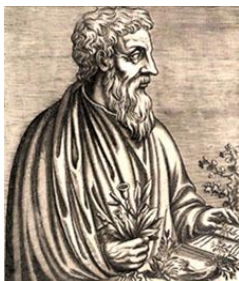
Pythagoras seems to have been the one who formulated it in a form such that he is considered as the first pure mathematician in history. The theorem is called Pythagorean sometimes due to the secretive nature of his society (Swaminathan, 2014). Pythagorean Theorem (PT) is widely used in medical imaging to precisely locate lesions and guide interventional procedures (He and He 2017).

Galen of Pergamum, by name of Greek Galenos, Latin Galenus, Greek physician, writer, and philosopher who exercised a dominant influence on medical theory and practice in Europe from the Middle Ages until the mid-17th century. His authority in the Byzantine world and the Muslim Middle East was similarly long-lived (Britannica, 2018).

Galen was born in 129 A.D. in Pergamum, a city with its great temple to Asclepius, God of healing and a library of 50,000 volumes. His father, Aelius Nicon, was a wealthy cultured architect and land owner who provided young Galen with an education in philosophy and politics (Nutton, 1973).



Galen of Pergamon is best known as the most influential exponent of the ancient world's cumbersome medical doctrines especially humoral theory and for many subtle anatomical discoveries, as well as mistakes about human anatomy and physiology. Galen is antiquity's most prolific author in Greek, and his works formed the basis of medical education in the Byzantine Empire and in Europe for many centuries. But Galen saw himself mainly as a medical practitioner and not as an anatomist, theorist, or researcher. He treated patients in the Roman Empire, and mainly in the city of Rome, for many decades—from about 162 CE until his death sometime after 203—and his works are today our most immediate insight into how medicine was practised by the ancient world's most highly trained doctors (Mattern, 2011).



The pharmacopeia of Pedanius Dioscorides, entitled (*De Materia Medica*, *On Medical Matters*) was written in Greek about the year 65. It was destined to be one of the most famous books on pharmacology and medicine but is also rich in horticulture and plant ecology (Janick and Stolarczyk 2012).

The original non-illustrated manuscript of “*De Materia Medica*” no longer extant, contained medical information on about 600 plants, 35 animal products, and 90 minerals. The work was divided into five books based on drug affinity: (1) Aromatic Oils Ointments, Trees; (2) Living Creatures, Milk and Dairy Products, Cereals and Sharp Herbs; (3) Roots, Juices Herbs; (4) Herbs and Roots; and (5) Vines and Wines, Metallic Ores. Max Wellmann (1906–1914) published a critical Greek edition in 3 volumes in 1906–1914 (Beck, 2005).

Pedanius Dioscorides was a Greek physician, pharmacologist, botanist, and author of *De Materia Medica* (*On Medical Material*) —a 5-volume Greek encyclopedia about herbal medicine and related medicinal substances (a

pharmacopeia), that was widely read for more than 1,500 years. He was employed as a medic in the Roman army. (Wikipedia, 2018)

#### **At a glance of Greek contribution in medical science**

1. US Army Medical corps and several medical organization e.g. Swiss medical printer, The Guildhall Museum in London, in India and elsewhere most major hospitals, medical colleges, clinics, professional bodies, prescriptions and medical journals have been adopted Rod of Hermes or Caduceus depicted as a stick entwined by two snakes and surmounted wings
2. Rod of Asclepius is the logo of the WHO (World Health Organization), American Medical Association, Swiss Medical Association, Emergency medical care (ambulance services) where the snake and staff in the center of the symbol etc.
3. The bowl of Hygieia, a bowl with serpent entwined is the symbol of Pharmacy in different countries, e.g. All of Europe, Austria, Germany and Hungary etc.
4. The word Hygiene came from Hygieia who was a Greek goddess of health and associated with the prevention of sickness and the continuation of good health.
5. Hippocrates held the belief that illness had a physical and a rational explanation. He rejected the views of his time that considered illness to be caused by superstitions and by possession of evil spirits and disfavor of the gods.
6. Hippocrates developed an Oath of Medical Ethics for physicians to follow. This Oath is taken by physicians today as they begin their medical practice.
7. Aristotelian virtue theory provides a practice-based focus for health care and Pythagorean Theorem is widely used in medical imaging.
8. Galen developed of various scientific disciplines, including humoral theory and for many anatomical discoveries.
9. Unani treatment is based on Hippocratic conceptions which Galen developed that human health requires equilibrium between the four main bodily fluids, or humors—blood, yellow bile, black bile, and phlegm. Each of the humors is built up from the four elements and displays two of the four primary qualities: hot, cold, wet, and dry. The theory allowed doctors to make more precise diagnoses and to prescribe specific remedies to restore the body's balance.

#### **Conclusion:-**

It is undeniable matter that present medical science is too much grateful to Greek civilization. Their knowledge of medical science was so authentic and scientific that the Greek historical legendarily person Hippocrates is considered as a father of medical science. Their symbols e.g. Caduceus, rod of Asclepius, bowl of Hygieia is closely related to our health sector. Our health oriented logo is resembled to the symbol of Greek at anyhow. Their mythology, civilization, concept and idea have been adopted to our health sector.

#### **Conflict of interest:**

We have no conflict of interest.

#### **Acknowledgement:-**

We would like to acknowledge to different site from where Images are collected.

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