

## Ancient Medicine – a Review

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**SUMMARY** Different aspects of medicine and/or healing in several societies are presented. In the ancient times as well as today medicine has been closely related to magic, science and religion. Various ancient societies and cultures had developed different views of medicine. It was believed that a human being has two bodies: a visible body that belongs to the earth and an invisible body of heaven. In the earliest prehistoric days, a different kind of medicine was practiced in countries such as Egypt, Greece, Rome, Mesopotamia, India, Tibet, China, and others. In those countries, “medicine people” practiced medicine from the magic to modern physical practices. Medicine was magical and mythological, and diseases were attributed mostly to the supernatural forces. The foundation of modern medicine can be traced back to ancient Greeks. Tibetan culture, for instance, even today, combines spiritual and practical medicine. Chinese medicine developed as a concept of yin and yang, acupuncture and acupressure, and it has even been used in the modern medicine. During medieval Europe, major universities and medical schools were established. In the ancient time, before hospitals had developed, patients were treated mostly in temples.

**KEY WORDS:** ancient medicine, medical healing, causes of diseases, hospitals

### INTRODUCTION

*“Natural forces within us are the true healers of disease”*

Hippocrates (460-356 BC)

Religion and medicine have a long and intertwined history, going back thousands of years. Magic and science, and medicine and religion have many very strong similarities (1). Religion had an essential part in the birth of ancient medi-

cine: medicine interacts with the spiritual and religious realm of the human mind (2). All human societies have medical beliefs that provide explanations for, and responses to birth, death and disease. Throughout the world, illness has often been attributed to witchcraft, demons, adverse astral influence, or the will of gods. The rise of scientific medicine in the past two centuries has altered or replaced many historic health practices.

The Bible is a genuinely documented book presenting the wisdom, medical knowledge and culture of a nomadic race (3). Only within the past 200-300 years have these twin healing traditions been clearly separated (4). Moral self-regulation was all the more important in ancient medicine since medical training and practice in the Greek and Roman worlds were not subjected to any legal state regulations. Physicians, on the one hand, had to acquire scientific skills through voluntary efforts and, on the other hand, had to offer the image of a "friend-physician". For centuries, the Hippocratic Oath (5) was the basis for medical etiquette and as such determined the professional attitude of physicians in modern medicine (6,7).

In Greek mythology, Zeus was considered the God of gods as well as the protector of health. Theophrastus Paracelsus (1493-1541), a physician, alchemist and philosopher, believed a human being to have two bodies: a visible body that belongs to the earth, and an invisible body of heaven (8,9). The primitive Chinese attributed diseases to demons. *Pranic healing*, which means "life-force" by using "no-touch" methodology, was widely practiced in ancient civilizations like Japan, China, Greece and Polynesia, and various names were used for this force (i.e. *Ki, Chi, Pneuma, Mana, Ruah*) (10). Hence, the treatment was in the hands of priests and sorcerers who employed divination, incantation and magic and/or the use of special herbs.

In ancient medicine, the skin was regarded as an organ in and of itself, as "*soma organikon*", and even as the longest organ of all. Skin, according to the traditions, was an organ which reflected almost every pathological and regenerative process (11,12).

In the view of ancient Israelites, "death is good or at least acceptable" after a long life, when a person dies in peace and when there is a continuity in the relation with the ancestors. "Death is bad" when it is premature or violent (13). During the age of Hellenism and Roman Empire, "good death," death in luxury, or death without suffering could be styled euthanasia (14).

The focus of this review is to present historical development of medicine through the centuries with regard to different cultures and civilizations.

## MEDICINE IN VARIOUS ANCIENT SOCIETIES AND CULTURES

### Egyptian medicine

Some kind of medicine was already practiced

in Egypt in the earliest prehistoric days, such as the use of malachite as an eye paint in the Badarian age, around 4000 BC (15). The oldest yet discovered papyrus writing is the Kahun Gynecology Papyrus, dating back to 1825 BC (16). It describes the methods of diagnosis of pregnancy and the sex of the fetus, toothache during pregnancy, diseases of women, as well as feminine drugs, pastes and vaginal applications. The oldest extant Egyptian medical texts are six papyri from the period between 2000 BC and 1500 BC based on older texts dating possibly from 3000 BC (17).

A famous medical school was established in old Alexandria during the third century BC (18). The most important Alexandrian physicians were Herophilus and Erasistratus. Anatomy was particularly advanced due to the possibility of dissecting human body. Figure 1 indicates that the ancient Egyptians often suffered from osteoarthritis.



**Figure 1.** Mummy with spinal contracture.

The most famous, elaborate and preserved medical papyri are the Edwin Smith Papyrus (around 1600 BC) and Ebers papyrus (about 1550 BC). They describe the anatomy of the head, brain, heart, blood circulation, pulse, and tumors, as well as the steps of examination in modern physical practice (15,16). Edwin Smith Papyrus describes the earliest known surgery in Egypt performed around 2750 BC. Figure 2 shows that trepanation in the prehistoric times was performed with tiny instruments. It would take 30-40 minutes to cut out a

part of the skull and to reach the brain membrane. At that time, trepanation was performed for heavy head injuries.



**Figure 2.** Surgery in the ancient time (skull trepanation).

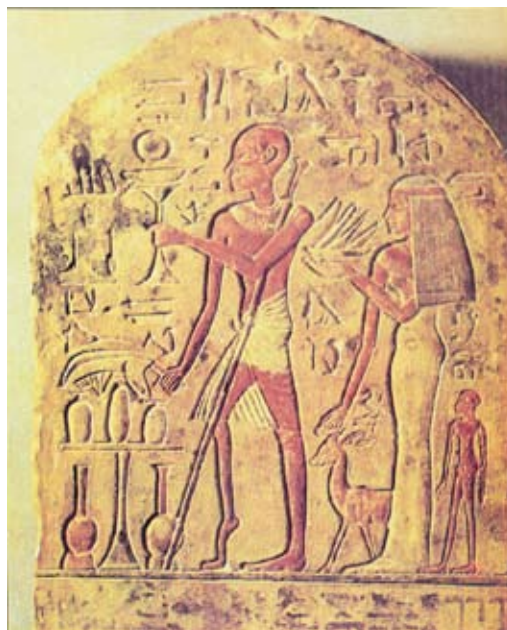
The Ebers Papyrus from around 1550 BC provides the earliest possible documentation of ancient awareness of tumors. The Kahun Gynecological Papyrus treats women's complaints (19,20). Figure 3 shows cancerous growth in the head of a dead man. It undoubtedly shows the presence of cancer in the prehistoric times. Other remaining skulls show numerous inventive surgical procedures of the ancient surgeons.



**Figure 3.** Cancerous growth on the head of a person from prehistoric times.

In magical papyri, headaches are attributed to the actions of demons and supernatural forces, whereas medical papyri emphasize the role of head trauma and of "pain matter" occurring in the body. Treatment could be magical, pharmacological or surgical (21).

Figure 4 shows the skeleton of a mummy with the left leg 8 cm shorter. The stick used to assist walking was placed inside the grave along with the dead body.



**Figure 4.** A man most probably suffering from spinal poliomyelitis.

#### Greek medicine

The foundation of modern medicine can be found with the ancient Greeks. Ancient Greece created two types of medicine. Firstly, a priestly-religious one, with the God Asclepius and temple treatment, and secondly, a rational one formed by Hippocrates (22).

Aesculapius was most probably a physician who practiced in Greece during the 11<sup>th</sup> or 12<sup>th</sup> century BC (23,24). He was considered the mythical Greek god of healing. The symbol of the serpent intertwined around the rod of Aesculapius denoted the idea that serpents could renovate themselves and had the capacity of finding out the healing power of plants (25). Figure 5 shows that two serpents are commonly used to symbolize the presence of medical practice. Internationally, the most popular symbol of medicine is the single serpent-entwined staff of Aesculapius, the ancient Graeco-Roman god of medicine. The daughters of Aesculapius were Hygeia, considered the goddess of health, and Panacea, the goddess of healing.

Galen (129-200 AD) and Hippocrates (around 470-410 BC) are the two leading representatives of ancient Greek and Western medicine (26). Hippocrates (5<sup>th</sup> century BC) is perhaps the most famous physician in the entire history and is called the father of modern medicine. He expressed the strong link between astrology and medicine in the ancient world. Astrology, astronomy, herbology



**Figure 5.** Serpent as an internationally popular symbol of medicine.

and medicine had been taught as a unified field of study from ancient times until Hippocrates separated Greek medicine from superstitions, magic and religion. He founded the Coan school at Cos around 430 BC (27). Hippocrates, for the first time, supported the rationality of the etiology of disease – prognosis and treatment should be based on scientific observations and on the study of human body. He believed that illness had a physical and rational explanation. He was also the first physician who believed that thoughts, ideas and feelings come from the brain and not from the heart, contrary to the belief of many others.

Measurements of the human face as part of the body has been performed since the Greek era and many aspects of ancient measurements can be found in modern clinical anthropometry (28). About 160 years after Christ, the Greek physician Galen began the practice of examining the post-mortem anatomy of various animals and extrapolating his findings in an attempt to understand the structure of the human body (29,30). Galen was the most famous Greek physician during the Roman period.

### Roman medicine

The rise of Roman medicine did not begin until the new level of military organization had been in place. Hospitals were only built for the military (31). In the early period and at the height of the Empire, the organization of health care of the Roman army was first created during the reign of Augustus. It consisted of military physicians and assistants as well as military hospitals (32).

Before that period, Romans deeply believed that disease came from the anger of the gods. Since diseases sooner or later went away, they

believed they had managed to please the gods by performing the correct religious acts. Magic treatments were very common. The Romans believed in the four humors and the power of bloodletting (33-35).

Ancient Roman medicine was a combination of physical techniques using various tools, and holistic medicine using rituals and a religious belief system. Early Roman medicine was a mixture of religion and witchcraft, but it eventually became more influenced by the Greek medical sciences (36). The first recorded doctor (*medicus*) to come to Rome was Arcagathus, who arrived from the Greek Peloponnese in 219 BC. He was an expert wound surgeon. Over 100 years lapsed before another Greek physician, Asclepiades of Bithynia (around 100 BC), had taken up residence in Rome (37,38). The Romans inherited some ideas of anatomy and medicine from their Etruscan ancestors and adapted them to the practice of the official state religion, especially in the practice of hepatoscopy or reading the divine signals in animal livers (39).

Galen saw the inside of people by looking at wounded soldiers and gladiators. Galen understood that the blood was pushed around the body by the heart. He also knew that nerves controlled the movement of the body, and that people thought with their brain. Galen also described a number of occupations and their associated diseases (30).

### Mesopotamian medicine

Diseases in Mesopotamia were often blamed on pre-existing spirits: gods, ghosts, etc. Each spirit was held responsible for only one of what we could call a disease in any part of the body. It was recognized that various organs could simply malfunction, causing illness (40). Mesopotamia had produced a rich corpus of medically related texts, which include sources on anatomical and disease terminology from Old Babylonian and Assyrian diagnostic and prognostic texts (41,42). The first description of a migraine can be traced back nearly 2000 years to the ancient civilization of Mesopotamia (43,44). The earliest known medical texts date back to 2000 BC. These texts helped the magician by giving him information on the potential diagnosis or prognosis of the diseases (45). The medical treatment consisted mostly of plant as well as animal and mineral parts.

### Indian medicine

Indian medicine mixed religion with secular medicine. Surgery was also widely used in Indian

medicine. In ancient India, for instance, ayurvedic medicine was very popular and was defined as the "knowledge of living" (46). The earliest foundations of ayurveda were built on a synthesis of selected ancient herbal practices dating back to the early second millennium BC (47). Ayurvedic medicine utilizes diet, detoxification and purification techniques, herbal and mineral remedies, yoga, breathing exercise, meditation and massage therapy as holistic healing methods (48). Rasayana therapy has been described in Ayurveda as a systematic and scientific medical discipline. According to the Charaka Samhita, "life" itself is defined as a "combination of the body, sense organisms, mind and soul, the factors responsible for preventing decay and death, which sustains the body over time and guides the processes of rebirth".

#### **Hindu medicine**

Hindu medicine, an ancient Indian medicine, goes back to 6000 BC. According to Hindu mythology, Lord Brahma, the creator of the Universe, compiled ayurvedic texts with medicine and surgery as the main subjects. The original concept of Ayurveda was essentially linked to Dhanwantari, who is considered the god of Hindu Medicine (49). Diseases during the pre-Vedic and Vedic period (6000 BC-700 BC) were attributed to supernatural powers, magic, etc.; hence the treatment consisted of prayers, to appease the supernatural powers, and religious rites, talismans, amulets, etc., to counter evil magic (50).

In Pakistan, the people of Indus Valley civilization, even from the early Harappan periods, had knowledge of medical dentistry. There is evidence of teeth having been drilled, dating 9000 years back (51). Prehistoric dental instruments found in Pakistan suggest ancient dental health care.

#### **Tibetan medicine**

Tibetan medicine has a history of over one thousand years (52). The "ecological" science of Tibetan medicine describes the macrocosm of the world we live in and the microcosm of our body and mind and gives us a means to understand how they are directly interrelated (53,54). The Tibetans integrated the medical knowledge of the pre-Buddhist Tibetan shamanistic religion, Boen, with the medical practices of India, China, Persia and Greece.

Traditional Tibetan culture has been nourishing a deep and powerful integration of spiritual and practical understanding, respecting both of these aspects of human nature and their potential

for supporting health and healing. Many Tibetan llamas, of all traditions, perform special spiritual practices to the benefit of individuals who are ill or recently deceased. Tibetan Buddhists consider the "Medicine Buddha Empowerment" to be the most powerful blessing for healing, dispelling sickness and for awakening the innate healing wisdom that lies within every individual (55).

#### **Islamic medicine**

The Islamic civilization rose to primacy in medical science as Muslim physicians contributed significantly to the field of medicine, including the subject of anatomy and physiology, with such persons as Abu al-Qasim (Abulcasis), Ibn al-Nafis, Ibn Sina (Avicenna) and Al-Razi (Rhazes) (56,57).

Ibn Nafis (1210-1288 AD) described human circulation. Al-Kindi (805-873 AD) was a great Muslim doctor who wrote many books on the subject of medicine. Avicenna (980-1037) is considered one of the greatest medical scholars in history and wrote *The Canon of Medicine* and the *Book of Healing*, which remained popular textbooks in the Islamic and Medieval Europe for centuries. In the 15<sup>th</sup> century, the Persian work by Mansur Ibn Muhammad entitled *Tashrih Al-Badan* (*Anatomy of the Body*) contained comprehensive diagrams of the body's structural, nervous and circulatory systems.

#### **Hebrew medicine**

Most of the ancient Hebrew medicine during the last millennium BC comes from the Torah, i.e. the five books of Moses, which contain various health related laws and rituals such as isolating infected people, washing after handling a dead body, and burying excrement away from camp (58,59).

The commands concern prophylaxis and suppression of epidemic, suppression of venereal diseases and prostitution, care of skin, bath, food, housing and clothing, regulation of labor, sexual life, discipline of people, etc.

#### **Chinese medicine**

Traditional Chinese medicine is a natural medicine that has roots more than 5000 years old. It is largely based on experience and is guided by a holistic concept and based on the belief that the mind, body and spirit equally affect health (60). Chinese medicine is a holistic, "whole-oriented" system of healing that treats the entire body and the spirit as a whole (61). Shen Nung (2838-2698 BC) was the legendary "Father of Chinese medicine". The concepts of Yin and Yang represent

the Chinese understanding of the physical world, which is divided into “mutually dependent opposites” (62,63). The character for Yin is female, “the dark side of the mountain”, and represents qualities such as cold, stillness, passiveness and darkness. The character for Yang is masculine, “the bright side of the mountain”, and represents such qualities as warmth, activity, light and expression. The principle of medical treatment is to attain a state of balance between Yin and Yang. Yin and Yang, together with blood, constitute the vital substances which circulate in the body (64,65).

The principal concept of Daoism includes five elements: earth, fire, metal, water and wood (66). One of the Chinese treatments, acupuncture, is one of the oldest, most commonly used medical techniques in the world, originating in China more than 3,000 years ago (67). Chinese medicine believes that meridians (14 major pathways) conduct energy (*qi*) between the surface of the body and the internal organs. It is energy that regulates spiritual, emotional, mental and physical balance. When the flow of energy is disrupted, by poor health habits or other circumstances, pain and/or disease can result.

A closely related type of treatment is acupressure, a form of massage that similarly concentrates on specific points in order to tonify and balance the system in the body (68). In addition, the use of the radial pulse as a diagnostic tool is an integral part of traditional Chinese medicine (69).

### Ancient European medicine

The roots of European medicine stretch back to ancient times (70). The first recorded use of plants in Europe as healing agents were depicted in cave paintings discovered in the Lascaux caves in France dating back to 13000-25000 BC.

Hippocrates (5<sup>th</sup> century BC) emphasized the importance of observation and description of the course of the patient's illness. He also believed that health depended on the weather, in particular on the effects of winds, types of water and properties of soil (71). Galen (2<sup>nd</sup> century AD) constituted the model for medical practice in Europe and the ancient Greek concept of humors was still used in the 17<sup>th</sup> century (72). Galen defined disease as the impairment of body activities. He combined Hippocratic tradition and the anatomical pathology of Alexandrian medicine. Roman medicine was largely based on the Greek model. It was from the Roman love of bathing in warm, natural mineral waters that the modern spa and hydrotherapy have derived.

The first Renaissance doctor to effect a cure with drugs was Theophrast von Hohenheim (“Paracelsus”, 1493/94-1541). He was a famous Swiss physician, alchemist, philosopher and theologian, and is today celebrated as the first modern medical scientist (73,74). Paracelsus believed a human being to have two bodies: a visible body that belongs to the earth and an invisible body belonging to heaven. Paracelsus described his view of “*lunatic*” (75) that man is influenced by three lights and according to this, man consists of the body, the soul and the spirit. Concerning the therapy of “*lunatici*,” Paracelsus wrote a book on occupational diseases, which identified diseases of miners, which he attributed to vapors from the metals. Georgius Agricola also described occupational diseases of miners and metal workers. Andreas Vesalius of Brussels (1514-1564) was an anatomist, physician, and is often referred to as the founder of modern human anatomy. In 1543, he published one of the most influential books on human anatomy, *De humani corporis fabrica*, with a beautiful exposition of human anatomy. Figure 6 shows a man suffering from spinal tuberculosis indicating that ancient people were affected by this condition in their time.



**Figure 6.** Clay sculpture from the earliest time with typical signs of spinal tuberculosis.

Paintings and drawings by Lucas Moser, Leonardo da Vinci and Albrecht Dürer suggest that operations on people who had cleft lips were being performed already during their time (1431-1520). The portraits show diagnostic facial profiles with a curved nasal dorsum, short columella, maxillary retrusion and pseudopognathism (76).

Medieval Europe witnessed the establishment of major universities and medical schools in Salerno, Bologna, Montpellier, Padua, Oxford, Paris, Cambridge, Vienna, Heidelberg, Leyden, Prague and Krakow. These medieval establishments provided the basis for the study of medicine. Although anatomy and physiology developed in the 15<sup>th</sup> and 16<sup>th</sup> centuries, it was not until the 17<sup>th</sup> and 18<sup>th</sup> centuries that we begin to see the introduction of new concepts of both human physiology and clinical medicine (77).

### The evolution of hospitals

Medical institutions referred to as "Houses of Life" are known to have been established in ancient Egypt since as early as the 1<sup>st</sup> Dynasty. By the time of the 19<sup>th</sup> Dynasty, some workers enjoyed such benefits as medical insurance, pensions and sick leave.

The evolution of the hospital is traced from its onset in ancient Mesopotamia (78). Institutionalized healthcare facilities existed in India as early as the 5<sup>th</sup> century BC and also in Sri Lanka, China and Southeast Asia. Marinozzi (79) has described the development of assistance and welfare activities to sick people from the Asklepieia to Monastic hospitals. In Theurgical medicine, cure from sickness was peculiar to gods, mostly to Apollo, Artemide and Asclepius. In the temple of Asclepius, prayers, sacrifices, offerings and magical rituals began to be associated with medical practical exercise and rational therapeutic system.

The origin and development of hospitals in the West were related closely with religions and wars (80). Before the Medieval Ages, priests or physicians treated their patients mainly in temples, which may be regarded as the earliest type of hospital. During the Medieval Ages, most hospitals were attached to monasteries. The military hospital first appeared in Ancient Rome, due to war (81). In Roman times, the military and slave hospitals, which existed since the 1<sup>st</sup> century AD, were built for a specialized group and for the public. The organization of patient care in the Roman military hospital was described by Cushing (82). It is to the Christians that one must turn for the origin of the modern hospital.

In Rome itself, the first hospital was built in the 4<sup>th</sup> century by a wealthy widow, Fabiola (78). In the early Middle Ages (6<sup>th</sup> to 10<sup>th</sup> centuries), under the influence of the Benedictine Order, an infirmary became an established part of every monastery. During the late Middle Ages (beyond the 10<sup>th</sup> century), monastic infirmaries continued

to expand, but public hospitals were also opened. From the 16<sup>th</sup> century on, hospitals spread in Europe and North America and the function of hospitals in medical treatment, education and research strengthened gradually.

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