

# Chapter 1

## Historical Background

We begin by reviewing the history of Islam and the development of medicine and healthcare in this context. The story begins long before the emergence of Islam and extends through several distinct periods: the beginning and rise of Islam, the Islamic Golden Age, the decline of the Golden Age, and the tumultuous transition to modern times.

### Ancient Empires and Their Religions

Human civilization has its origin in the Middle East and North Africa. Religion, medicine, and healthcare were intimately connected from the beginning. This relationship, however, waxed and waned depending in part on the attitudes and influences of the rulers who controlled the region. The Sumerian (4000–2550 BCE), Akkadian (2400–2200 BCE), Babylonian (1800–1500 BCE), and Assyrian (1400–800 BCE) empires fought to take control over the rich and fertile land between the Tigris and Euphrates rivers (Mesopotamia) and surrounding areas. The Sumerians are thought to have first settled southern Mesopotamia between 4500 and 4000 BCE after migrating there from Eastern Europe (present-day Hungary) to escape the bitter cold of the Ice Age. Ancient Sumerian texts describe the Epic of Creation—which, secular historians speculate, may be a source for the Biblical book of Genesis (Heidel 1963).

The Sumerian city/state of Ur is where the patriarch Abraham was born, raised, and lived much of his adult life. What we know about him comes primarily from Biblical sources, which suggest that Abraham was born around the year 1976 BCE and left the region around 1901 (Thompson 2002). However, information contained in the Book of Jubilees and Mesoretic Torah puts his birth about a hundred years later between 1884 and 1812 BCE and his departure from Ur between 1809 and 1737 BCE. Other sources (the Samaritan Pentateuch, for example) place Abraham's birth even later (around 1513 BCE). Regardless of the exact date, Abraham lived during

the period when the Akkadian and Babylonian empires dominated the region. The primary religion of these empires during that time was Ashurism. The word Assyrian comes from Ashur, the chief Assyrian god (Van Der Toorn et al. 1999). According to mythology, Ashur was the god of war who replaced Marduk (the son of the Sumerian god Enki) as king of the pantheon (gods and goddesses of the ancient world).

The Egyptian and Persian empires would also have strong influences on this region. The Egyptian empire to the south and west of Mesopotamia dates back to 3100 BCE, reaching its peak between 1600 and 1100 BCE, when it covered much of North Africa around present-day Egypt and regions next to the Mediterranean Sea in the Middle East. The Egyptian empire had many gods and deities (e.g., Horus, Ra, Isis), although formal religious practice centered around the Pharaoh, who acted as an intermediary between the people and the gods (and was often worshiped as a god). A renaissance man who lived around 2600 BCE, Imhotep, is considered by some to be the world's first physician and was himself ultimately deified.

The first Persian empire reached its height between 550 and 300 BCE and spanned from Egypt on the west to Turkey on the north, and from Mesopotamia to the Indus River on the east. It was the largest empire the world had ever known, exceeding even the Assyrian empire before it. The religion of the empire was Zoroastrianism, one of the first monotheistic religions which emerged out of ancient Iran in 1200–1500 BCE (Foltz 2011). By the sixth century BCE, Zoroastrianism had become the established religion of the region and would have strong influences on Judaism, gnostic Christianity, and later Islam. Zoroastrianism emphasized the constant struggle between good and evil, a battle in which good would eventually triumph. It continues to have many followers in Iran and India today.

The Persian empire would not be seriously threatened until the Roman empire began spreading eastward, beginning in the third century BCE. The Roman empire continued to advance eastward, peaking in 90–120 CE, when it controlled large portions of North Africa and the Middle East. It was not until the fall of the Roman empire in 275–475 CE that its influence began to diminish. The Roman empire was polytheistic, with many gods and goddesses. The Roman leaders negotiated with the gods and were themselves worshiped as gods similar to pharaohs in the Egyptian empire. It was not until the Edict of Milan in 313 CE that Christianity became the official religion of the Holy Roman empire (as it came to be called).

Around the third century CE, the Sassanid empire (Neo-Persian or the second Persian empire) began to take control over the Middle Eastern lands previously held by the Holy Roman empire. The Sassanid empire would dominate the region until the armies of Islam conquered it in 651. The state religion of the Sassanid empire was again Zoroastrianism, as in the first Persian empire.

## Religion and Early Medicine

All diseases in ancient Egypt and Mesopotamia were thought to result from religious forces, either evil spirits or the actions of the gods. During this period of history, the healing art of medicine was considered a religious practice.

Early Egyptians believed a person consisted of a physical body (“khat”) and a soul. The soul consisted of three parts: the ka, the ba, and the akh. The “ka” was thought to be an exact double of the person and was the life force that animated the body. It was expelled when the person died, but remained close to the physical body. The “ba” was how a person acted (their personality) and was thought to be unique for each individual. The ba was separate from the life force (ka), and survived after the body died. The ba was symbolized by a bird, often a falcon. After a person died, the ba would roam around on the earth during the daytime with the living and return to the underworld at night with the dead. Given the right circumstances, the ka and ba would unite after death to form the “akh.” The akh “was the transfigured spirit that survived death and mingled with the gods” (Wissemann 2003). It was thought to survive in the afterlife only if the person had lived a good and worthy life.

For those with financial resources, physical healing in ancient Egypt was performed through the “temple sleep,” where a person would take drugs to induce sleep and dreaming. During the sleep, priests would whisper suggestions into the sleeping person’s ears. This worked well for the wealthy. A different system was in place for the unwealthy. For the common people, the specific healer depended on the type of ailment causing the suffering. If the condition was due to accidents or fighting, the *sunu* (regular physician) dealt with the problem. If the condition resulted from a scorpion sting or snakebite, the *kherep serqet* or priest of Serqet (the scorpion goddess) was sought. This healer made pleas and performed rituals to the goddess. For physical illnesses or those with unknown causes, an exorcist (physician-priest) was consulted. The exorcist prescribed the appropriate spells, incantations, or prayers to various gods to rid the body of evil spirits. These prayers were often made to Sekhmet, the Egyptian goddess of healing. The exorcist would also administer unpleasant strong smelling, nasty tasting medicines either by mouth or via other body orifices.

The situation was similar in early Mesopotamia. Treatments for illness were both spiritual and physical. The *Treatise of Medical Diagnosis and Prognoses* is the oldest surviving medical text from ancient Mesopotamia and dates back to around 1600 BCE (Avalos 1995). The document, recorded on 40 cuneiform tablets, conveys centuries of Mesopotamian medical knowledge. There were two kinds of healers in early Mesopotamian medicine. The first was the Ashipu who was a type of sorcerer and member of the clergy. This healer determined whether the illness was due to sin (i.e., error in behavior on the person’s part) or was caused by a spirit, demon or god, and which spirit was responsible for the illness. Depending on the diagnosis, the Ashipu could either drive out the spirit through charms or spells, or send the sick person for physical treatment to an Ashu, the second type of healer. The Ashu was a craftsman and specialist in herbal medicine (physician) (Paulissian 1991). The Ashu would refer to medical texts for knowledge on how to treat a disease using bandages, massage, and salves, but would occasionally resort to incantations and supernatural methods as well. Physicians (Ashu) themselves worshiped several healing dieties (Ninazu, Ninib, and Gula, in particular), and both physician and patient were likely to invoke them for healing. The emblem of Ningishzida (son of the god Ninazu) was a double-headed snake, from which today’s medical symbol may have come from.

Medicine in ancient Persia was also practiced by religious and nonreligious specialists, with considerable overlap between the two (like in Egypt and Mesopotamia). There was the *ravan-pezeshek* (priest) who treated the mind, psyche, or soul, and the *tan-pezeshek* (physician) who treated the physical body. One of the early Iranian medical texts, the *Vendidad*, written around the eighth century BCE, distinguished three types of medicine: surgery, healing by herbs, and healing by divine words. Centuries later, a registration for physicians was developed in Persia that separated them from quacks and charlatans. While medicine became more distinctly separated from the priesthood over time, students at the medical school in Jundishapur in the third century CE were trained in both medicine and theology. After graduation, they had to choose whether to become a priest (called magi) or a physician.

Thus, religion and medicine in ancient times were closely related and their specialists often worked hand in hand.

## Pre-Islamic Times

During the centuries preceding the emergence of Islam, Arabia was a large area covered primarily by desert and roamed by nomadic Bedouin tribes. Towns were established at locations where water was available and trade routes intersected. One of these places was Mecca (Makkah). Here there was a natural spring where the Damascus-Yemen trade routes crossed. Located in Mecca was the Kaaba or *al-Ka'bah* ("The Cube" or "The Sacred/Forbidden House"), which contained many idols representing the gods of different Bedouin tribes. This was a polytheistic and primitive society characterized by frequent wars and feuds between tribes, attacks on caravans traveling along the trade routes, and many different religions (including those that buried female children alive to appease blood-thirsty gods). This period before the emergence of Islam has been called the "age of ignorance" (Nagamia 2003).

In 76 CE, with the destruction of Jerusalem by the Romans, many Jews fled to Arabia carrying with them their Greco-Roman medical knowledge. In 271 CE, the second Sassanid King Shapur I of the Persian empire founded the city of Jundishapur (or Gondeshapur) in Khuzistan located in present-day southwestern Iran. Soon after Shapur I captured the city, Syrian Christians came to Jundishapur from Antioch (Turkey). Among them were a group of Syrian physicians trained in Damascus. Centuries later, in 489 CE, Nestorian Christians (supporters of Nestorius, the Archbishop of Constantinople) came to Jundishapur from Edessa, Mesopotamia, after the Roman emperor Nero plundered the city. Among the Nestorians was a large community of physicians and medical scholars from the medical school in Edessa before Nero closed it. Thus, a critical mass of Jews and Christians began to accumulate in Jundishapur. Soon after arriving there, Nestorian physicians began building a hospital, medical school, pharmacology laboratory, library, and began translating medical texts into Arabic (Taylor 2010). When the

Roman emperor Justinian closed the Academy of Athens medical school in 529 CE, many Greek physicians with their medical knowledge also came to Jundishapur. Not long afterward, several well-known physicians from India (including Mankah and Sustura) also came to the city.

The result of this migration of physicians from Southeastern Europe, southern Asia, and North Africa to Jundishapur was the development of a center of Greek, Syrian, and Indian Medicine that had no match anywhere in the world at the time. The medical school in Jundishapur was modeled after training programs in Alexandria (Egypt) and Athens (Greece). When Muslims took over Jundishapur in 638 CE, the hospital and medical school were already well established. This would become the model for Islamic hospitals and medical schools in the Middle East for centuries to come.

## Early Islamic Period

When Islam emerged in the early seventh century, the major powers were the Persians and Byzantines (eastern Christians), although disorganized government structures and rampant corruption led to a weakening of these powers. Christianity, Judaism, and Zoroastrianism, as well as many tribal religions, were practiced in different parts of the Middle East at this time. It was into this environment that on April 26, 570 CE, the Prophet Muhammad was born in Mecca. As noted above, the region at this time was characterized by widespread polytheism. There was a great socio-economic gap between the rich and the poor. “Allah” was considered the chief God, but there were many smaller gods that mediated between Allah and humans. Even the Kaaba in Mecca had become polytheistic. Statues of hundreds of idols were housed within the Kaaba (one for every day of the year) (Armstrong 2002). According to a well-known Hadith, the Kaaba was built as a place of worship to the one and only God by Abraham and Ishmael (Bukhari 4/55/583).<sup>1</sup> The custom of the time was for people of the region to make a pilgrimage to Mecca once yearly to perform the *Hajj*, whether Christian, Jew, or pagan.

Much took place during the 60-year period between 570 and 632 CE. The Prophet Muhammad’s life did not start out easy. He lost his father before he was born and his mother died when he was only 6 years old. After living a couple of years with his grandfather, his grandfather also died and he was then forced to live with his uncle, Abu Talib, who took care of him for the rest of his childhood. The Prophet belonged to the Banu Hashim clan, which was part of the Quraysh tribe, a powerful group of merchants that controlled Mecca and the Kaaba. In his 20s, the Prophet Muhammad worked as a trader for a wealthy widow, Khadijah.

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<sup>1</sup> Citations to *Sahih Bukhari* (the most respected of all Sunni Hadiths) is based on a 2009 translation by M. Muhain Khan (2009). We list the reference by volume, book, and number (vol/book/no). See [http://d1.islamhouse.com/data/en/ih\\_books/single/en\\_Sahih\\_Al-Bukhari.pdf](http://d1.islamhouse.com/data/en/ih_books/single/en_Sahih_Al-Bukhari.pdf) (last accessed October 3, 2013).

Although 15 years older than he was, Khadijah and the Prophet married and remained together for over 25 years until her death in 619 CE.

In 609, during deep prayer in a cave on mount Hira, the Prophet at the age of 39 began to receive revelations from God through the angel Gabriel. The revelations would continue for the next 23 years until his death. The angel told the Prophet to tell the revelations to others, so he dictated them to those who could write. They recorded his words verbatim (as he had heard them) on tablets, bones, flat rocks, and the wide flat ends of date palm leaves. These writings were eventually compiled into a book called the Qur'an (Koran), the text which Muslims believe is the Word of God. Although it is not clear when the writings were compiled into a single volume, this was done some time within 20 years of the Prophet's death. Scholars agree that the third caliph Uthman ibn Affan canonized the Qur'an around 653–656 CE to produce the present-day Qur'an. All other copies of the Qur'an existing at the time were burned, as this version became authoritative. The longest suras (chapters) at the beginning of the Qur'an are actually the last revelations to the Prophet (called "Medinan" suras), whereas the shorter chapters toward the end were the first messages (called "Meccan" suras). The revelations focused on the oneness of God (monotheism) contrasting with the polytheism of the day, and emphasized the importance of giving to the poor to reset the economic imbalance so prevalent at that time.

The revelations received by the Prophet Muhammad were not initially met with open arms by the Meccan community; they saw the Prophet as a threat to their religions and economic well-being. Many Arabs came to the Kaaba to worship their gods and engage in trade along the way. The Prophet underwent great persecution during this time. By his late 40s, not only were his teachings rejected and his entire clan boycotted and almost starved to death, but his wife died and his uncle and protector Abu Talib also died. To avoid persecution and probably assassination, he and his followers escaped to Medina in 621 (the start of the Muslim calendar, AH or *anno hegirae* in Latin). Over the next 10 years, the Prophet led a number of battles both against the Meccans and against the Jewish tribes in Medina to solidify his reputation and protect his followers. He died on June 8, 632 (AH 11) in Medina.

The Prophet Muhammad was not only a religious leader, but also a warrior and a statesman. He was the first to bring the warring tribes in Arabia into a unified Islamic state. During a period of about 20 years after the revelations began, Islam would spread over most of Arabia, and during the 30 years after the Prophet's death, under the leadership of Abu Bakr (close friend and father-in-law of the Prophet) and the three caliphs ("successors") that followed, Islam would spread rapidly far beyond Arabia. Within 100 years, the influence of Islam had reached as far as Spain and parts of France on the west, to China on the east, to Africa and Egypt on the south, to India, Turkey, and central Asia on the north, to Syria and the entire Middle East, nearly one-quarter of the known world. The spread of Islam would give rise to three Muslim dynasties (rulers from the same family): Umayyad dynasty (661–750 CE) (that continued to rule the Western Islamic empire from Cordoba, Spain from 756 to 1031), the Abbasid dynasty (750–1258 CE) with Baghdad (Iraq) as its center, and later the Fatimid dynasty (909–1171 CE) based in Cairo (Egypt).

The conquest and assimilation of many different people groups by Islamic rulers influenced health practices in each region. The health beliefs and practices in the region, however, could not conflict with Islamic law. Islamic law (*shari'ah*) directed life from birth to death, including health practices. Islamic law did not distinguish secular from religious law, and covered all aspects of religious, political, and civil life (Savage-Smith 1995). It was derived from the Qur'an, the sayings and traditions of the Prophet Muhammad (Hadith), and the practices of the early Muslim community (Sunnah). Islamic law was interpreted during the first century of Islam by judges (qadis), appointed by the governors of the provinces, who were appointed by the caliphs (during the early *Umayyad* caliphate between 661 and 700 CE, in particular).

During the early eighth century, a separate group called Traditionists began recording the traditions and sayings of the Prophet Muhammad (Hadith), which included decisions made by the early Umayyad qadis along with the sayings and traditions of the Prophet. The Traditionists believed that the law should be based on the traditions and sayings of the Prophet alone (along with decisions of the early qadis mixed in), and that there should be no further interpretation. Islamic law, however, was not systematized or “codified” as law was in the West, but instead relied on the legal opinions of muftis (Islamic scholars) based on the previous sources (Qur'an, Hadith, Sunnah, and early qadis interpretations). By the end of the eleventh century, this gave rise to four schools of law: the Hanafi, the Maliki, the Hanbali, and the Shafii, where the Hanbali and Shafii schools were the most conservative, and the Hanbali school was the more conservative of the latter two. The Shafii school of law, which held that the Hadith had overriding authority but also relied on legal reasoning that depended on analogy, was the law most often applied to medicine. We will come back to these schools of Islamic law in future chapters.

## Medicine of the Prophet

The first type of medicine before Islam emerged was pre-Islamic Arabic Medicine, which was practiced by the Bedouin tribes and was based on Arab customs and natural treatments found in the desert environment. With the rise of Islam came other approaches to medical treatment. According to Nagamia (2003), the Qur'an does not say much directly about medicine, except for the benefits of honey and the need to avoid alcohol and other intoxicating substances. Nagamia notes, however, that the Hadith referred to a number of health practices that eventually became known as *Al-Tibb Al-Nabawi* (Prophetic Medicine). Prophetic Medicine focused on eating a healthy diet, avoidance of alcohol, treatments involving natural products, and practices such as “cupping” for symptoms of fever, headache, pain, or eye problems. Some practices, however, were more substantial—such as separating those with conditions such as leprosy or plague from healthy individuals. Despite its name, however, Prophetic Medicine was not based on revelations from God to the Prophet in the Qur'an, but more on the customs that had been approved by the

Prophet Muhammad. One reason for the rise of Prophet Medicine was that the Islamic orthodoxy wanted to counter the increasing influence that the teachings of Galen (a pagan of Greek and Roman descent) was having on Islamic Medicine (Rahman 1998, p. 42).

This approach to medicine reached its greatest influence during the fourteenth and fifteenth centuries with the writings of Al-Jauziyah, As-Suyuti, and Az-Zahabi, who were religious scholars, not physicians. Of particular interest for our purposes, these writers stressed the emotional aspects of illness and the need for patients to use their faith for healing. For example, Al-Jauziyah encouraged physicians to ask patients about aspects of their life besides their physical symptoms. This included exploring the patient's emotional state, their lifestyle, and diet (Abdullah 2003). They stressed that Muslim physicians should consider the effects of the patient's emotional state on their physical illness, and instructed patients to recite positive statements from the Qur'an and the Sunnahs to speed the healing process. They urged physicians to prescribe moral behaviors such as love, courage, patience, kindness, and provide for the needs of others, along with prayer (Ayad 2008). Patients were to engage in these activities to build their faith and mobilize psychological and spiritual resources for combating illness. Summing it all up, As-Suyuti advised physicians to be "gentle in speech, kind in words, and close to God" (Thomson 2009). Prophetic Medicine, grounded on the writings of theologians and religious leaders, was popular among religious Muslims because of its theological basis (although it was weak on scientific medical theory).

## Spiritual Medicine

Distinct from Prophetic Medicine (although overlapping with it) was a type of practice called "Spiritual Medicine" or "Spiritual Healing," which emphasized several healing practices that continue to be used by many Muslims today. These include reciting passages from the Qur'an or prayers to Allah either by the sick person or by friends and family to either protect a person from disease or to treat the disease (Nagamia 2003). This might include the ingestion of honey and/or the drinking of water that had been prayed over using verses from the Qur'an (Oyewole 2006). Amulets, while not encouraged by the Prophet, were allowed if used with verses from the Qur'an. Another healing practice of Spiritual Medicine was writing verses from the Qur'an on a piece of paper, dissolving it in water, and then drinking the water, timing the ingestion to specific times during the day such as sunrise (Rahman 1998, p. 89). A text written in the ninth century called *Khawass al-Qur'an* (Properties of the Qur'an) describes the healing properties of reading passages from the Qur'an, linking specific passages with specific diseases (Al-Tamimi, n.d.). For example, reciting Chapter 38 of the Qur'an over a sleeping person was used to treat breathing problems, whereas writing the verses down on paper and reading them during waking hours was thought to cure illness in general.



Islamic philosopher and theologian Fazlur Rahman<sup>2</sup> describes one example of Spiritual Medicine in a case from the twelfth century. Failing to cure a patient with severe abdominal pain with drugs, the health professional (a pharmacist) recited the opening sura of the Qur'an: "In the name of God, the Lord of Mercy, the Giver of Mercy! Praise belongs to God, Lord of the Worlds, the Lord of Mercy, the Giver of Mercy. Master of the Day of Judgement. It is You we worship; it is You we ask for help. Guide us to the straight path: the path of those You have blessed, those who incur no anger and who have not gone astray" (Qur'an 1:1). Following this, he blew his breath in the direction of the patient. He then prayed "O my Lord, my God, my Master! You have said in your firm, true, and indubitable Book [the Qur'an], 'We send down the Qur'an as a restorer of health and as mercy for the believers' [17,82]" (Rahman 1998, p. 95). He then cleansed himself, stood on his prayer rug, and began to pray. He soon received news that the patient had been cured.

## Golden Age of Islam

As a result of Islamic religious teachings, which regulated and stabilized every aspect of daily life, an ethical code developed that balanced the rights of the individual with those of the community. This ethical code brought stability to many regions governed by the Islamic empire. The result was a period of intense learning and scientific progress, which became known as the Islamic Golden Age. This period extended nearly 500 years from the middle of the eighth century, when the Abbasid caliph transferred the Eastern Muslim empire's capital from Damascus to Baghdad, until 1258, when the Mongols conquered Baghdad thus ending the Abbasid dynasty (Gregorian 2003). The supreme religious and political leader of the Islamic state was known as the *caliph* (successor to the Prophet Muhammad). The two most famous caliphs who ruled during the early Golden Age were Al-Mansur (712–775 CE) and Harun al-Rashid (754–809 CE). Al-Rashid was the caliph portrayed in the *Arabian Nights*, a series of stories and folk tales written in

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<sup>2</sup>In this chapter we frequently cite the work of Fazlur Rahman (1919–1988), who has been described as "the most learned of the major Muslim thinkers in the second-half of the twentieth century, in terms of both classical Islam and Western philosophical and theological discourse" (<http://www.freerepublic.com/focus/fr/531762/posts>). In addition to being a highly reputable and exact Islamic scholar, he studied the original sources and translated into English many texts that are now available only in Arabic, Persian, Turkish, or Urdu. Considered a Sunni scholar and philosopher, he was raised in Pakistan and obtained a Ph.D. in Islamic philosophy from Oxford University. He is known widely as a prominent moderate reformer, and served for many years as the leader of the Islamic Research Institute in Pakistan. After leaving that position, he taught at the University of California at Los Angeles and later became the Harold H. Swift Distinguished Service Professor at the University of Chicago and the first Muslim member of the Divinity School faculty at the University of Chicago. He grew up in a Sunni family of the Hanafi school (representing reason). His famous textbook *Islam* (1979, University of Chicago Press) is used as an undergraduate text in many Western universities.

Arabic during this period (although did not receive widespread acclaim until the first English language edition in 1706) (Lyons and Petrucelli 1997).

Early in the ninth century, the House of Wisdom (*bayt al-hikmah*) was established in Baghdad. Here Greek scientific and medical texts brought in from Constantinople and other learning centers were translated into Arabic. The head of this institute was Abu Zakariya ibn Masawayh, a Nestorian Christian physician from the medical school at Jundishapur. He was the personal physician to four successive caliphs. The House of Wisdom collected, synthesized, and expanded knowledge obtained from ancient Egyptian, Greek, Roman, Chinese, Indian, Persian, and Byzantine scholars. Many original Greek manuscripts on medicine and science by Hippocrates, Aristotle, and Galen were lost due to wars and invasions. However, due to Arabic translations from the House of Wisdom, the knowledge from these manuscripts was preserved for scientists and physicians in both the East and the West.

During the Islamic Golden Age, the Middle East was considered the center of medical and other scientific learning in the world. Only later did such learning spread westward to Europe. Even the *Canterbury Tales* mentions Al-Majusi (Haly), Al-Razi (Razis), and Ibn Sina (Avicenna or Avicen) among the great physicians that fourteenth century readers would be familiar with:

With us her was a Doctour o Phisyk  
 In all this world ne was ther noon him lyk  
 To speke of phisik and surgerye,...  
 Wel knew he the olde Esculapius,  
 And Deiscorides, and eek Rufus,  
 Old Ypocras [Hippocrates], Haly [Haly Abbas], and Galien [Galen],  
 Serapion, Razis, and Avicen... (Chaucer (1387–1400) 1957)

## Islamic Medicine

The advances in science and the arts during the Islamic Golden Age resulted in the emergence of Islamic Medicine. Separate and distinct from pre-Islamic Arabic Medicine, Prophetic Medicine, and Spiritual Medicine (discussed earlier), this form of medicine was more “scientific and analytical” (says Nagamia). Islamic Medicine depended on medical knowledge acquired from translations of Greek, Roman, Indian, Syrian, and Persian writings and from original discoveries made by Islamic physicians themselves.

Islamic Medicine emerged out of interactions between pre-Islamic indigenous local traditions, Greco-Roman influences, and religious beliefs (Nagamia 2003). Initially, there was some debate about whether Islamic physicians should use the medical techniques inherited from Greek, Roman, and Chinese physicians, since these techniques were viewed by some as pagan practices. Eventually, however, Islamic authorities gave Islamic physicians freedom to use whatever medical treatments they wished. As a result, early Islamic Medicine focused on balancing the

humors, as Hippocrates had done and Galen in the second century had refined, and incorporated influences from both Indian (Ayurveda) and Iranian Medicine.

The translation of medical knowledge from early scholars (particularly Greeks) into Arabic not only contributed to the development of Islamic Medicine, but later contributed to the development of Western Medicine up through the early Renaissance. Arabic translations occurred primarily between the seventh and tenth centuries, as Islamic physicians examined and compiled the scientific works of Hippocrates and Aristotle, Galen, and Greek scholars from Alexandria (Herophilus, Erasistratus). Eventually translated from Arabic into Latin, this medical knowledge would influence the practice of medicine for nearly 1,000 years (from 600 to 1600 CE) and reach far beyond the Middle East to Western Europe and ultimately to the Americas. For example, the Latin version of *Canon of Medicine*, authored by Islamic physician Ibn Sina, was published more than three dozen times between the fifteenth and sixteenth centuries in Europe.

*Surgery in Islamic Medicine.* Surgery was not commonly practiced as part of Islamic Medicine (probably due to poor results, says Nagamia). However, a number of surgical procedures were routinely performed in early Islamic societies. These included bloodletting and cauterization. Cauterization involved burning of a wound with a red hot metal rod to slow bleeding or prevent infection. Bloodletting (usually directly from veins) was part of the Galenic tradition of balancing the body's humors. "Cupping" was a form of bloodletting, and could be either wet (incision made and suction provided with a cupping glass) or dry (no incision). To prevent infection after surgery, the wound was often cleansed with wine, oil of roses, salt water, or vinegar (Pormann 2007). In the tenth century, Islamic physicians were not only treating eye diseases with medicines, but were also removing cataracts by a suction technique (see Ali Ibn Isa's "Notebook of the Oculist") (Ayad 2011).

Dissection of the body, however, was generally forbidden—since Muslims believed in the afterlife and that a vital spark (Ruh) was reawakened after death and rewarded in paradise (heaven) (Lyons and Petrucelli 1997). A passage from the early writings of Islamic physician and surgeon Al-Nafis suggests that dissection was not a common practice: "The precepts of Islamic law (shari'ah) have discouraged us from the practice of dissection (tashrih), along with whatever compassion is in our temperaments." Remarking on this passage, Savage-Smith notes that this gives no "clear sense of prohibition or interdiction, but only a general sentiment that the conventions, or perhaps rules, of the shari'ah had discouraged or deterred them (saddana) from the pursuit of dissection (mubsharat al-tashrih)" (Savage-Smith 1995, p. 100). Nevertheless, in a careful review of early Shari'ah laws, she could find nothing about dissection being forbidden.

*Pharmacology in Islamic Medicine.* Distinctive contributions were also made to the field of pharmacology during the Islamic Medicine period (also, see Al Kindi below). In fact, pharmacy as a distinct discipline separate from medicine was probably established for the first time under Arabic rulers during the Islamic Golden Age. Arabic techniques for identifying and purifying medicines included distillation, crystallization, sublimation, reduction, and calcination—basic processes in

chemistry and pharmacy. In the late ninth century, Al-Razi's text *al-Hawi* contained a description of over 800 drugs (Nagamia 2003). In the tenth century, Al-Zahrawi wrote a book titled "Al-Tasrif" that included a section on drug preparations, compounding of drugs, and dosages. This was followed in the eleventh century by Al-Biruni's *Kjtab al-saydalah* (Book of Pharmacology) devoted entirely to drugs and dosages.

*Hospitals.* Another major contribution of Islamic physicians was the establishment of the hospital (also called the "bimaristan"). In fact, the first Muslim hospital service may have been located in the courtyard of the Prophet Muhammad's mosque in the city of Medina (Alam and Siddiqui 2007). The Prophet had a special tent erected in front of the mosque to provide medical aid to soldiers wounded in battle, and assigned women there to attend the wounded.

*Umar ibn Al-Khattāb* (634–644 CE), the second caliph after Abu Bakr (632–634 CE), supported the development of public welfare programs that included hospitals. This was paid for by the *zakat* (private contributions by individuals as required by the Qur'an). Not only did these hospitals provide care for sick patients within the building itself, but also sent physicians out into the community to provide care to those living in poorer, remote rural areas. The "ambulant" hospital was carried on camelback in caravan style with food, water, medicine, operating rooms, and a team of physicians, nurses, and other attendants. This was also useful during military campaigns. For example, the caliph sent a company of physicians protected by soldiers to the battlefield during war with Persia. The army of Ghaznavid sultan Mahmud was said to have been accompanied by a medical team carried by 40 camels (Rahman 1998, p. 67). Hospitals were also places where physicians could study and do research.

These were early efforts to provide medical care to the sick and wounded. However, Caliph Al-Walid is said to have built the first "real" hospital in Damascus around 707 CE, which was mainly for the blind who needed help getting about and for lepers to keep them away from healthy people (Miller 2006). Patients were segregated based on their condition, such that lepers had their own separate facilities. Standard hospitals that cared for patients with a range of medical and surgical conditions did not appear until the beginning of the Abbasid Caliphate in 750 CE. These early hospitals were secular, and served all people regardless of race, religion, or financial status (some hospitals even contained a chapel for Christians) (Shanks and Dawshe 1984). Patients could stay in the hospital for as long as necessary for them to get well enough so that they could return to work (Alam and Siddiqui 2007).

In the mid-eighth century, Al-Mansur, the second Abbasid caliph who founded the city of Baghdad, invited Jurjis Bukhtishu, a Christian physician and head of the medical school in Jundishapur, to treat a stomach complaint of the caliph. The treatment was a success, and the Al-Mansur gave Jurjis a position in his court. Although he soon returned to Jundishapur, his grandson Jibril (also Christian) came to Baghdad and established his medical practice there. He rose to prominence after successfully treating Caliph Harun al-Rashid's severe headaches. For his position as

physician-in-chief of the main hospital in Baghdad, Jibril was paid 4.9 million dirhams (\$1.3 million USD today) per year. In contrast, a doctor working at the hospital for two days and two nights a week was paid 3,600 dirhams (\$972 USD) per year (Nagamia 2003). Medical schools and hospitals in Baghdad, and eventually those built by successive caliphs throughout the Muslim world, would be modeled after the medical school in Jundishapur because of Jibril's influence. A Persian Christian, Yuhanna ibn Masawaih (son of a pharmacist brought by Jibril to Baghdad from Jundishapur) eventually took Jibril's place as head of the main hospital in Baghdad. By the early tenth century, many hospitals had been built throughout the Muslim world, including those in Mecca and Medina. These were often headed by Christian physicians (Yuhanna ibn Masawaih, Abu 'Uthman al-Dimashqi, and Sinan ibn Thabit, for example) (Rahman 1998, p. 66). More on this later.

Hospitals were not only built to serve medical and surgical patients, but also to treat psychiatric patients. The first humane psychiatric hospitals (and psychiatric wards in general hospitals) were established during the ninth and tenth centuries, nearly 300 years before such institutions were founded in the West (Mohit 2001). The quality and complexity of hospitals in Jundishapur, Damascus, Baghdad, and Cairo reached their zenith during the Islamic Golden Age, surpassing even Christian hospitals in the East and the West (Lyons and Petrucelli 1997). Besides hospitals, special homes for older women and for orphans were built, and medical teams were even mobilized to visit the sick in jails. Vizier Ali ibn Isa, who served under the 18th Abbasid caliph Al-Muqtadir bi-Allah from 913 to 928 CE, was especially known for establishing hospitals and mobilizing ambulant medical teams (Rahman 1998, pp. 66–67).

The queen of all hospitals, however, was built in Cairo in 1284 CE. The Mansuri Hospital was known as the most luxurious hospital in the entire Middle East and North Africa. The Sultan himself (Mansur Qala'un) participated in its construction by bringing in artists from throughout the East to assist in its design. Patients with conditions such as fever, eye diseases, internal medicine problems, and surgical illnesses were placed on separate wards, as were men and women. The Mansuri Hospital had originally been a palace that could hold more than 8,000 people. There was a chapel for Christians and a mosque for Muslims. According to Rahman (1998, pp. 70–71), the hospital continues to operate today and specializes in eye diseases. When patients were discharged from the hospital, it was said that they were given five pieces of gold to help them to recuperate (Lyons and Petrucelli 1997).

## **Islamic Physicians**

As noted earlier, Islamic physicians (called *Tabib* or *Hakim*) made many original contributions to medicine, surgery, and pharmacology. This is particularly true in the area of ophthalmology. The writings and research by Ibn al-Haitham remained the most respected work on this subject until modern times (Saunders 1978). Likewise, Hunain ibn Ishaq contributed ten original works on ophthalmology.

Original contributions were also made by Islamic physicians in anatomy and physiology (pulmonary circulation), surgical techniques, infectious diseases (scabies, tuberculosis), psychology, and ethics. Many of these contributions were absorbed into Western Medicine, often without giving credit to the Islamic physicians who discovered them.

Physicians were taught to keep careful records of their treatments in the event that someone accused them of malpractice. In that event, treatment records were reviewed by their peers who would decide on the case. Prior to the existence of medical schools and teaching institutions, most physicians were educated in an apprenticeship system. Those who wanted to become doctors followed experienced physicians around, observing and copying their practices. For many years, it was the physician mentor (not an institution or certifying body) who granted a license (*ijaza*) to practice medicine to new physicians (Rahman 1998, p. 81).

Medicine was practiced primarily by Christian and Jewish physicians during the early years of Islam, a fact that al-Shafi'i (founder of the Shafi'i school of jurisprudence, one of the four Sunni schools of law) lamented in the following quote from the ninth century: "I do not know of any type of knowledge, after the knowledge of what is lawful and what is unlawful, more noble for a Muslim[to acquire] than that of medicine but, alas! They have neglected it—they have neglected one-third of human knowledge—and abandoned it to Jews and Christians" (Al-Dhahabi 1961). Early famous Islamic physicians existed in families, with the Christian Bukhtishu family being the oldest (765–801 CE). Other physician families were the Masawayh family (prolific writers and famous ophthalmologists) and the Ishaq family (first translators of Greek and Syrian medical texts into Arabic). However, Al-Kindi, Al-Tabari, Al-Ruhawi, Al-Razi, Al-Majusi, Al-Zahrawi, Ibn Sina, and Al-Nafis were the physicians who gave Islamic Medicine its reputation during Islamic Golden Age.

One of the first great Islamic physicians was **Al-Kindi** (800–870 CE), who developed a medical formulary (*Aqrabadhin*), which described the preparation of medicines from herbs and plants, animals (musk), and minerals. Besides drugs that had been used by Greek and Roman physicians, he also included medicines from Persia, Egypt, and India. Muslim physicians used an assortment of natural substances to treat patients, including sedatives and pain killers derived from the opium poppy and hemp plant (cannabis).

The first true Arabic encyclopedia of medicine (*Firdous al-Himah* or Paradise of Wisdom) was a seven-volume treatise written by **Al-Tabari** in 860 CE (Meyerhoff 1931). Al-Tabari pointed out the close relationship between psychology and medicine, making original contributions to mental healthcare in the areas of child development, psychotherapy, and counseling (Amber 2004). He also warned that while opium from poppy leaves was useful to treat pain and induce sleep, it could also kill.

One of the earliest surviving Arabic manuscripts on medical ethics is *Adab al-Tabib* (Ethics of the Physician) written in the ninth century by **Al-Ruhawi** and based on the works of Hippocrates and Galen. Interestingly, Al-Ruhawi was a Christian from the Nestorian sect and was still Christian when he wrote *Adab al-Tabib*, which was based on Muslim beliefs and principles (Levey 1967).

According to Nagamia, Al-Ruhawi “examined not only the relationships between a patient and a physician, but also a physician’s personal standards of behavior, conduct of daily activities, morality and even his relationship with God” (Nagamia 2003). In *Adab al-Tabib*, Al-Ruhawi stated that it was a physician’s duty to integrate spirituality into the care of the patient: “The philosopher can only improve the soul, but the virtuous physician can improve both body and soul. The physician deserves the claim that he is imitating the acts of God the Exalted as much as he can” (Levey 1967). Al-Ruhawi also recommended how a physician should start out the day (before seeing patients): “He should wash his mouth, clean and polish his teeth. Then it is necessary to examine the order of his bodily organs...His clothes should be useful and attractive. Following all this is prayer. Then he should read the book of his religion, then books of the ancients on medicine” (Rahman 1982).

Like Al-Ruhawi, many Islamic physicians viewed the practice of medicine as a holy vocation. Rahman (1998, p. 94) notes that *hakim*, the word for physician in Arabic (meaning full of knowledge and wisdom), is also one of the names of God in Islam. Ishaq the Isra’ilite, a physician who wrote a book of 50 aphorisms in the tenth century said, “Visiting and healing the poor and needy patients is your special duty because a more meritorious work you cannot perform” (Ullman 1970). According to Rahman (1998), “It is clear, then, that theologians and traditionists who wrote Prophetic Medicine works, on the one hand, and the writers of scientific medicine, on the other, valued medicine as a religious vocation of the first order because it helps men and women to help others preserve and restore health” (p. 39).

Indeed, **Al-Razi** (Rhazes in Latin) (865–925 CE) exemplified this tradition, although his approach was more broadly “spiritual” than religious. Al-Razi has been variously called the “father of Islamic Medicine” (Shuttleworth 2010), “the Galen of Arabs,” and “the greatest physician of the Muslim World” (Karaman 2011). His name is probably the most recognized of all Islamic physicians. Rahman (1998, p. 94) says that Al-Razi had so many students that patients were seen first by students of his students. Failing a successful diagnosis by the secondary student, the primary student saw the patient next. If the primary student failed to make a diagnosis, the patient was finally seen by Al-Razi himself, who conducted an exhaustive examination. Born in Persia, near present-day Tehran, Iran, Al-Razi studied language and literature, philosophy, mathematics, astronomy, and medicine. He wrote over 200 books, including a 23-volume treatise, *Kitab al-Hawi fi al-tibb (al-Hawi)* (Comprehensive Book of Medicine) that brought together all the Islamic medical knowledge of his time. This text would become a primary source for Western Medicine up through the seventeenth century. In fact, a copy of *al-Hawi* resides in the U.S. National Library of Medicine and is considered one of the oldest medical manuscripts in the world in existence today. This book contains a summary of Greek, Syrian, Hindu, Persian, and early Arabic Medicine, all of which Al-Razi was trained in. He was also a scientist who conducted medical research that involved observation and experimentation. Nearly 1,000 years before the germ theory of disease, Al-Razi was convinced that such diseases as smallpox and measles resulted from something in the blood (infection).

Not only a rigorous scientist, Al-Razi was a true clinician, emphasizing the important role that the psychological state of the patient played in their health. In *al-Hawi*, he wrote: “The physician, even though he has his doubts, must always make the patient believe that he will recover, for the state of the body is linked to the state of the mind” (Tibi 2006). His approach to treating patients underscored the importance of trust between physician and patient. The physician was obligated to care for the patient, but the patient was also obligated to comply with the treatments prescribed by the physician. Included in his medical evaluation were questions about the patient’s background and any illnesses suffered by family members. Al-Razi’s book on medical ethics (*Ahlaq al-Tabeeb* or “Ethics of a Doctor”) is a classic. He discussed here how the physician should behave toward patients, presenting a model for ethical behavior by Islamic physicians. Because all religions respect physicians, Al-Razi emphasized that doctors should take pride in their profession and practice it in a way that deserved this high calling.

Al-Razi also wrote a book titled *Al-Tibb al Rawhani* (Spiritual Medicine). Because both medicine and philosophy are closely related to Islamic values, he believed the physician has several responsibilities to the patient. First, the doctor should treat the patient with kindness, patience, concern, and professional confidence. Second, physicians should be themselves good and ethical people, otherwise their treatments will not be effective. Third, unless a patient has good morals, he or she cannot be physically healthy either. Thus, Al-Razi believed that good moral health in both the physician and the patient was essential for successful treatment (Rahman 1998, p. 96).

Despite his sensitivity to physician ethics and emphasis on providing free care to the poor, Al-Razi distanced himself to some degree from religion. Although he believed in God, it is said that he rejected formal religion and many of the core teachings of Islam. In an article published on *Muslim Philosophy Online*, Goodman describes a debate in which “Al-Razi answers that God has provided what we need to know, not in the arbitrary and divisive gift of special revelation, which only foments bloodshed and contention, but in reason, which belongs equally to all. Prophets are impostors, at best misled by the demonic shades of restless and envious spirits. But ordinary men are fully capable of thinking for themselves and need no guidance from another” (Goodman 1999).

Fazlur Rahman (1998) challenges critics of Al-Razi who claim that he was not a religious man, that he denied the Prophet Muhammad, and that he did not believe in revelation. Rahman points out (pp. 99–100) that some of what Al-Razi said came out in the heat of debate while defending himself. In fact, the statements by Al-Razi quoted above were made during a famous debate with a conservative Ismaili religious leader, and he was responding to that person’s esoteric doctrine involving Al-Talim and electionism. There is no doubt that Al-Razi believed that in order to fully understand a patient, the physician needs to understand both the physical and the spiritual aspects of the person (Karaman 2011). He said that the physical nature involved physical disorders, whereas the spiritual nature involved issues related to the spiritual self, i.e., moral diseases. In *Spiritual Medicine*, Al-Razi advocated caring for the whole patient and even includes a section on meditation. While he



focuses primarily on morality, ethics, and reason in this book, and largely avoids religion, Al-Razi does say that those who live according to their religion have nothing to fear in death. He emphasized that if persons should have doubts about their religion and are unable to establish its truth for themselves, then God is merciful and will forgive them. He notes that God never burdens someone beyond their capacity, and in fact, demands much less of humans than they can usually do (citing 2:286; 6:152, and 7:42 in the Qur'an, which all say that God does not burden people with more than what they can bear) (Rahman 1998, p. 99).

The next great Islamic physician, born in the famous medical city of Jundishapur and of Zoroastrianism faith, was **Al-Majusi** (Haly Abbas in Latin) (930–994 CE). He authored the *Kitab al-Malaki* (The Royal Book), which was one of the earliest illustrations of surgical approaches to skull fractures and other disorders. The text also discussed many internal diseases, their causes and treatments. Al-Majusi was a Persian physician and psychologist whose *Kitab al-Malaki* was considered superior in some respects to Al-Razi's Comprehensive Book of Medicine that preceded it and Ibn Sina's Canon of Medicine that followed. Al-Majusi was probably one of the three greatest physicians of the Islamic empire during this period. *Kitab al-Malaki* was used as a basic text at the medical school in Salerno, the center of medical training in Europe between the tenth and thirteenth centuries. Al-Majusi served as a royal physician during the Buwayhid dynasty in Baghdad. His frequent references to Allah in his writings suggest that he was a deeply religious man (Amber 2004).

A contemporary of Al-Majusi's was **Al-Zahrawi** (Albucasis in Latin) (930–1013 CE). Born in Cordoba, Spain, he was an Islamic physician known for his *al-Tasrif*, a 30-volume medical and surgical text. Considered by many to be the "father of modern surgery," Al-Zahrawi's text is one of the oldest books with illustrations of surgical instruments. In it he described many different operations, including those for varicose veins, skull fractures, removing teeth, forceps deliveries, and a host of others. *Al-Tasrif* was considered more systematic and practical than any other medical text of the time. Serving as a court physician to Al-Hakam II (the Adnalsian caliph of the Western Islamic empire), he is listed as one of the greatest physicians in Moorish Spain. His influence was felt throughout the East and the West, and his writings continue to influence the practice of surgery even today (Belen and Aciduman 2006). Al-Zahrawi discovered the hereditary nature of hemophilia and was the first to accurately describe ectopic pregnancy.

**Ibn Sina** (Avicenna in Latin) (980–1037 CE) was a great Islamic scholar who was a physician and teacher. According to Nagamia, Ibn Sina was the greatest physician of the Islamic era and possibly the greatest physician of all time, greater even than Al-Razi (Nagamia 2003). This claim is based on Ibn Sina's well-rounded education in many areas of science as well as religion, philosophy, metaphysics, and logic. He is said to have memorized the entire Qur'an by the age of 10 years. Born in Bokhara (present-day Uzbekistan in central Asia), he wrote over 100 books almost all in Arabic and nearly 450 treatises, of which 40 were on medicine. His most famous work was the five-volume *Kitab al-Qanun fi al-Tibb* (Canon of Medicine), which would later be translated into Latin and serve (along with Al-Razi's *al-Hawi*) as the basis for European Medicine. The Canon was a primary

textbook taught in European medical schools up through the seventeenth century. Nagamia (2003) quotes a professor of history at the U.S. National Library of Medicine as saying: “The medicine of the day was so brilliantly clarified by these compendia (especially those of Ibn Sina and Al-Majusi) and such order and consistency was brought to it that a sense of perfection and hence stultifying authority resulted” (p. 27).

The Cannon presented basic medical principles, discussed medicines used to treat illnesses, described organ-specific diseases and more general systemic illnesses, and addressed the prevention of illness. Ibn Sina emphasized checking the pulse and the color, cloudiness, and smell of a patient’s urine. He also stressed the need to give pure water to infants, and described the diseases that could result from failing to do. He, like Al-Razi, hypothesized that many diseases might be transmitted through the air. Ibn Sina carefully described common diseases of his day such as guinea worm infection, trigeminal neuralgia, and different types of facial paralysis.

Ibn Sina also addressed the area of the mind, and described a number of psychiatric illnesses. However, his perspective was different from Al-Razi’s when it came to religion. In his *Kitab al-shifa’* (Book of Healing), he discusses logic, the natural sciences, mathematics, and metaphysics. A deeply religious man, the first problem Ibn Sina tackles in this book is the existence of God based on intuition and reason, presenting both ontological and cosmological arguments to prove the existence of God. While describing a scientific and mathematical theory of the world, he attributed ultimate causation of everything to God (the “first cause”). Ibn Sina argued that since the soul is incorporeal, it must be immortal and that the decay and destruction of the body did not affect the soul. When his works were translated into Latin, they were said to influence many Christian philosophers including Thomas Aquinas (Kemal 2001).

Ibn Sina’s approach is illustrated in the concluding paragraph of his four-volume text titled *Remarks and Admonitions*: “O Brother. In these remarks I have brought forth to you the cream of truth and, bit by bit, I have fed you in sensitive words the best pieces of wisdom (p. 904). Therefore, protect this truth from ignorance, the vulgar, those who are not endowed with sharpness of mind, with skill and experience, those who lend an ear to the crowds, and who have gone astray from philosophy and fallen behind. Thus, if you find a person whose purity of heart and goodness of conduct you can trust, as well as his suspending judgement on that to which doubt hastens (p. 905) and his viewing the truth with the eye of satisfaction and honesty, then gradually, and in bits and pieces, give him the truth he requests, carefully observing what you get from what you have already given (p. 906). Ask him to heed God and the inescapable faith, following your manner in what you give him and taking you as an example. If you divulge or lose this knowledge, God will be the arbitrator between you and me. God is sufficient as a trustee” (Inati 1996, pp. 107–108).

In summarizing the contributions of Islamic physicians, well-known Islamic scholar A.S.B. Ansari notes, “The art of healing was dead, Galen revived it; it was scattered and dis-arrayed, Razi re-arranged and re-aligned it; it was incomplete, Ibn Sina perfected it” (Ansari 1976).

Among the last great Islamic physicians of this period was **Al-Nafis** (1213–1288 CE), who was born in Syria, and studied medicine, law, philosophy, and theology at the medical school in Damascus (Shuttleworth 2010). He focused on the respiratory and cardiovascular systems, particularly the route that blood took from the heart to the lungs. Al-Nafis discovered that blood flowed from the heart to the lungs via the pulmonary circulation, where it was then “purified.” This idea challenged Galen’s notion that the blood flowed directly from the right side to the left side of the heart through invisible pores in the septum. Al-Nafis’ observations came from detailed dissection, although not of the human body (to avoid conflict with his own religious beliefs). He also tried to integrate theology with anatomy, believing that the heart was the place where “spirit” was put into the blood, and that the pumping of the blood was necessary to disperse the invisible spirit throughout the body. His ideas about the heart and lungs could have greatly advanced Western Medicine had scientists been aware of his teachings, which were not widely disseminated. It was not until William Harvey’s discoveries in 1628 CE that the work of Al-Nafis was brought to the attention of others. It was not until the microscope was used by Antonie van Leeuwenhoek to study the lungs in 1676 CE that Al-Nafis’ observations were confirmed by directly viewing the pulmonary capillaries.

Unlike in the West, a more holistic view of the person and their medical or psychiatric illnesses developed among Islamic physicians, who were influenced by Indian philosophy and Muslim mystical thinkers (Mohit 2001). More and more, the human body and mind became viewed as a product of interactions between body, emotions, diet, soul, society, and behavior, all of which had to be evaluated in order to determine how to treat an illness. As noted earlier in this chapter, many Islamic physicians of this period believed that the person was not just made up of the physical body alone, but contained a life force—the *Ruh* (spirit or soul)—which enabled the body to function (Nagamia 2003). They believed that the *Ruh* came from the Almighty (God) to make the human person complete. Thus, Islamic physicians insisted that the *Ruh* had to be taken into account when treating a patient. The *Ruh* is mentioned in the Qur’an (17:85): “And they ask you (O Muhammad) concerning the *Ruh* (the Spirit); Say: ‘The *Ruh* (the Spirit) is one of the things, the knowledge, you (mankind) have been given only a little’” (Al-Hilali and Khan 1996).

## Period of Decline

Many factors, both political and environmental, led to a decline in Islamic Medicine and the Islamic Golden Age more generally, beginning in the thirteenth century. One factor was the corruption of rulers who had absolute power, which weakened the empire and made it more vulnerable to enemy invasions. Starting in the Central Asian steppes, Mongols led by the notorious leader Genghis Khan combined forces with the Turks in historical Mongolia, forming the Mongol empire in 1206. Mongol forces spread rapidly to Eastern Europe, covering large parts of Siberia to the north, Southeast Asia to the south, the Indian subcontinent, and penetrating deep into the Middle East.

This culminated in the invasion of the Eastern Islamic empire and in 1258, the takeover of Baghdad, the Abbasid capital and intellectual center. Mongols decimated the region, destroying universities, hospitals, and libraries, reversing many of the scientific and cultural achievements of the Islamic Golden Age. These events were understood by traditionalist Muslims as God's retribution against the people and their leaders for straying from the Sunnah (a view even maintained by the prominent physician and anatomist Al-Nafis) (Beg 2006). Interestingly, within 50 years of their invasion of Baghdad the Mongol conquerors had adopted Islam as their religion.

Many prominent scholars and doctors fled to India at this time, shifting the center of medical learning from the Middle East to this region of the world. According to Rahman (1998, p. 73), the Muslim Turkish Sultans of India—Muhammad ibn Tughlaq (1325–1351) and his successor Firuz Shah Tughlaq (1351–1388)—were physicians who built a broad complex of hospitals and medical clinics in Delhi. However, the quality of medicine declined substantially in Muslim regions after the Mongol invasions. Under the Mongol rulers, medicine was taught largely in religious schools (*madrasas*), which may have discouraged scientific research and progress, while favoring the integration of religion into medical care.

Although the Persian and Turkish Ottoman empires were able to largely hold their own against the Mongolians during this period, other regions of the Middle East were not so fortunate. Mongol rulers blocked the Industrialization and rapid technological advances in Islamic areas that were then taking place in the West. Mohit (2001) notes “no account of any meaningful system of care of ordinary people exists from this area... For example, in Iran during the Qajar dynasty between the seventeenth and late nineteenth centuries, there was an era of unprecedented decline and ignorance. Magic, superstition and fatalistic, rather hopeless attitude replaced the scientific approach to health and disease. The condition in Egypt was more or less the same” (p. 343).

The rise of the second Persian empire also contributed to the decline of the Golden Age. Beginning in 633 CE, the Islamic Arab armies began raiding the Persian Sassanid empire, and by 644, under the direction of Caliph Umar, they had completely conquered the Sassanids and soon the Persian lands were under firm Muslim control. With decline of the Islamic empire, however, Persia began to reassert itself as an independent state, and fought vigorously to maintain control and expand its influence in the region. From 1501 to 1979 (the year of the Iranian revolution), Persia was ruled by a succession of kingdoms including the Safavid, Afsharid, Zand, Qajar, and Pahlavi dynasties. From 1514 to 1823 CE, a series of 12 wars occurred between the Persian and Ottoman empires, but Persia (present-day Iran) remained under its own rulers. These wars, however, decimated many centers of learning and brought scientific progress in medicine to a standstill.

There were perhaps others reasons as well for the decline of the Islamic sciences. Admittedly, the 13 crusades led by European Christian powers against the “infidel” Muslims between 1095 and 1295 CE did not help. Another factor was the rising conflict between Sunni and Shia Muslims. Although many claim that the rise of the West led to a decline in the Islamic Golden Age of scientific and medical

achievements, the reverse was more likely. In other words, it was the decline of the Islamic empire that allowed the West to rise. With the fall of the Western Islamic empire in Spain (1492 CE) came the takeover by the West of much of the scientific and medical information accumulated by Muslims. This literature would serve as the foundation for the Renaissance in Europe and the Scientific Revolution in the eighteenth and nineteenth centuries.

The Eastern Islamic empire (which was the center of the Golden Islamic Age) was followed by the Ottoman empire, which lasted for over 600 years from 1299 to 1922 CE and did not value scientific progress and achievement as did its predecessors. A major turning point in the spread of the Ottoman empire was in 1453 CE with the conquering of Constantinople, the capital of the Byzantine Christian Roman empire. Although virtually destroyed during the war, the city was rebuilt and renamed Istanbul (city of Islam). The religion of the Ottoman empire had long been Islam (since 751 CE) and the rule was by Shari'ah law. The sultan was the highest position in the government, and also claimed the position of caliphate, the highest position in Islam. The Ottomans would expand until it peaked in 1520–1566 CE, when the empire controlled large parts of Western Asia, Southeastern Europe, Northern Africa, and much of the Middle East. While the primary religion of the empire was Muslim, the Ottomans were “uniquely” tolerant of people from other religions including the Orthodox Christians and Jews (many non-Muslims continued to be governed by the Greek Orthodox millet system). Unfortunately, there was a relative neglect of science, technology, and medicine in the lands that the Ottoman Turks controlled.

In 1838, the Ottoman sultan established the first Western-style medical school in Istanbul, staffed by Europeans. These westerners argued that the Islamic medical tradition had become outdated. Other Muslims countries soon followed the lead of the Turks. Only in India and Pakistan did the traditions of Islamic and Hindu Medicine survive (Rahman 1998, pp. 131–132).

During the decline and eventual end of the Ottoman empire between 1828 and 1922 CE, European Christian missionary doctors (and colonial armies) began to slowly bring modern scientific medicine into the region. With the growing influence of Western colonialism, the Islamic world was divided into a number of separate independent countries (see below). For some countries, this resulted in European influences on government styles, including the adoption of constitutional models and social changes that included a growing acceptance of Western medical treatments. This was followed by the establishment of public outpatient clinics and hospitals, and a decline in traditional or local forms of treatment. Leaders from Egypt and Iran began a constructive dialogue with Western countries, helping to develop science and technology in their regions. Modern hospitals began to be established, modeled after European hospitals. Islamic Medicine was affected by the rapid spread of Western conventional medicine, which eventually replaced it in most Muslim countries. The practice of traditional Islamic Medicine is now limited to India, Pakistan, and Bangladesh, which continue to have medical schools that teach it, known as “Unani” or “Tibi” medicine (Nagamia 2003).

At the end of World War I in 1922, the Ottoman monarchy was abolished with the signing of the Treaty of Lausanne between Turkey and the allied powers.

With this treaty (and other treaties during the 10 years that preceded it), the lands controlled by the Ottoman empire became independent countries. These include Cyprus, Greece, Romania, Bulgaria, Hungary, Egypt, Palestine, Jordan, Lebanon, Sudan, Syria, Libya, Iraq, Yemen, and Saudi Arabia (Asir and Hejaz). Since the 1940s, Muslim countries have gradually established their independence from Western colonialism, although according to Rahman, they are *culturally* still under the domination of the West (Rahman 1998, p. 133). Nagamia (n.d.) says that Islamic nations are now in the “dark ages” (p. 7) from which they need to emerge (but on their own terms).

Today, most Muslims see physicians for modern treatments, although continue to rely on their religious beliefs to meet social, cultural, and spiritual needs. Religious beliefs continue to have a strong influence on personal hygiene, diet, alcohol use, tobacco use, and eating, as well as on a variety of health practices across the life span from conception to death (see Chap. 3).

## Summary and Conclusions

Religion, medicine, and healthcare have been closely linked throughout the 1400-year history of Islam. Islamic physicians made seminal contributions to the field of medicine through accumulation, preservation, and translation of earlier Greek, Roman, Indian, Syrian, Chinese, Persian, and Byzantine medical texts into Arabic, as well as by their seminal original contributions in many areas of medicine, surgery, and pharmacology. The translation of Arabic texts into Latin and English would later serve as the basis for Western Medicine and for the scientific discoveries that followed and led to a renaissance of learning and discovery in Europe. Many of the first and best hospitals, including those for patients with psychiatric illness, were built during the Islamic Golden Age, and the patients in those facilities were treated in ways that modern hospitals today can only envy. Wars and invasions over the last 700 years have led to the decline of the Islamic Golden Age and Islamic Medicine, resulting in stagnation of science and technology. For over 1,400 years, Islam was a dominant force that directed the evolution of medicine and healthcare in the East and the West, and while its influence has waned some during the past few centuries, its recent growth and spread suggests a bright future ahead—if it can advance in science, medicine, and healthcare on its own cultural and religious terms.

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