The Contributions of Arabic and Islamic Civilization to Medicine

Islamic medicine refers to medicine developed during the period of Islamic Civilization which spanned for seven centuries with the rise of Islam in the Arabian Peninsula in the Seventh Century till the collapse of the Islamic empires in the Middle East and Spain in the Fourteenth Century. The Islamic medical texts were written in Arabic which was the language of science and knowledge during that period.

To understand Arabic and Islamic medicine and its contribution to our modern medical knowledge, we can broadly cover this subject into the following headings:

1. Phase of translation of ancient Greek and Roman medical textbooks to Arabic.

2. Phase of innovation with introduction of new medical knowledge through adoption of new ideas and discoveries

3. Phase of translation of Arabic medical texts to Latin to be transmitted to the Western world.

**Phase of Translation of Classic Greek and Roman Texts to Arabic
The Role of the Nestorians**

In the early days of Islamic civilization, there was a flurry of activities related to translation of what was available then of medical and scientific knowledge from the Greeks, Romans, Persians and Indians. This followed an unusual sequence of events involving the Byzantine and the Persian empires before the rise of Islam. A theological conflict arose in the church of the Byzantine Empire against the Nestorian sect of Christianity over the nature of Christ. The Nestorians were persecuted and their school of theological and scientific studies in Edessa was closed. The Persian Sassanids gave the Nestorians refuge and allowed them to have their school reopen in Nisibis. They also joined the Persian academy of Gundishapour in Khuzestan. There they translated Greek and Syriac texts to Persian.

In 638, the Sassanid Empire fell to the Muslims coming from Arabia. Gundishapour survived the change and persisted as an Islamic Academic Center for a few centuries. The Muslim Caliphs encouraged the translation of Greek and Roman medical books to Arabic.

Among the Nestorian physicians in Gundishapour who translated these works were the Bukhtishu family had six generations of physicians including Jibril ibn Bukhtishu and his grandson Jirjis bin Jibril served several Abbasid Caliphs. They translated the works of Galen, Aristotle, Plato and Pythagorus.

Another Nestorian who translated Greek texts was Yuhanna ibn Masawayh (Masue). He wrote several Arab monographs on several topics including ophthalmology, fevers, headaches, testing of physicians, dietetics and medical aphorism. A third Nestorian who translated Greek texts to Arabic was Hunayn ibn Ishaq (Johannitius). He was in charge
of Biet Al Hikmah (House of Wisdom) in Baghdad. He translated many works of Galen, Hippocrates, Plato, Ptolemy and Aristotle.

**Phase of Innovation**  
**The Great Arab and Muslim Physicians and Scholars**

This stage of innovations and creativity derived from direct observation and scientific methodological analysis. This is the stage of the famous Muslim physicians and scholars who wrote encyclopedic compendia used for centuries in the Muslim World and the West. Their influence on medieval European medicine was tremendous and their textbooks were the major references taught at European universities till the Seventeenth Century.

Several famous physicians emerged during the golden age of the Islamic Civilization in the ninth, tenth and eleventh century. Among the most eminent were **Al-Razi (Rhazes)**, **Ibn Sina (Avicenna)**, **Ali ibn Abbas al-Majusi (Haly Abbas)**, **Al-Farabi (Alpharabius)** and **Abu Rayhan al-Biruni** from the Eastern parts of that empire.

From Iraq, Syria and Egypt, there was **Al-Kindi (Alkindus)**, **Jabir ibn Hayyan, Ibn al-Nafis, Ibn al-Haytham (Alhazen), Ibn al-Mutran, Ishaq ibn Suleiman al-Isra'ili, Ibn Jazla Al Baghdadi and Ibn al-Baytar**.

From North Africa and Islamic Spain (Andalusia), there were several eminent figures including **Abu al-Qasem Al Zahrawi (Albucasis), Ibn Rushd (Averroes), Musa ibn Maimoun (Maimonides), Ibn al-Jazzar and Ibn Zuhar (Avenzoar)**. Herein, we briefly summarize the works of three of these scholars and physicians.

**Al-Razi (Rhazes)** (865-925), was born in Al Rayy, near present day Tehran, Iran. His early interest was in Alchemy and philosophy. He was credited with the discovery of sulfuric acid and ethanol. Later, he studied medicine and moved to Baghdad, the capital of the Abbasids, and was appointed as the chief physician of the largest hospital there. He wrote 224 books on various topics. His most important work was the medical encyclopedia known as **Al-Hawi fi al-Tibb**, known in Europe as **Liber Continens**. It was a compilation of his readings of Greek and Roman medicine, his own clinical observations and case studies, and methods of treatment during his years of practice.

He had significant contributions to neurology and neuroanatomy including descriptions of the cranial and spinal nerves. He was the original portrayer of small pox, and differentiated it from measles. He wrote the first monograph on pediatrics which was translated to Latin as **Practica Puerorum**.

**Ibn Sina (Avicenna)** (980-1037) was born near Bukhara in present day Uzbekistan. He was a prodigy child, and by age of 10, he memorized the Qur'an and was proficient in the Arabic language and its literature classics. At the age of thirteen, he started to study medicine and when he became 18, he was a well established physician. It is claimed that he wrote 425 works, 250 of them survived.
His book *Al Canun fi al Tibb*, known simply in Europe as *Canon*, is considered the most influential medical book ever written by a Muslim physician. It was translated to Latin by Gerard of Cremona in the 12th century, and became the textbook at the European universities till the seventeenth century. It is stated that the Canon went through 15 Latin editions in the last 30 years of the 15th century. It is composed of five parts, including descriptions of symptoms of diseases, therapeutics and dietetics, functional neuroanatomy of the spine, and psychiatric illnesses including the so-called "love disorder". He was credited to be the first to write on perinatal medicine.

**Abu Al Qasem Al Zahrawi (Albucasis) (936-1013)** was born near Cordoba, the capital of Muslim Spain (Al-Andalus). He served as the court physician of Caliph Hakam II of Islamic Spain during the golden rule of Arabs in that country.

Around the year 1000, he started writing his book *Al Tasreef Liman 'Ajaz Aan Al-Ta'aleef* (The Clearance of the Methods of Medicine). This medical encyclopedia of 30 volumes covered various areas of medical knowledge including medicine, surgery, midwifery, pharmacology, therapeutics, dietetics, psychotherapy, weights and measures and medical chemistry. Albucasis is known as a pioneer of surgery. He devoted three chapters in *Al-Tasreef* for surgery detailing surgical procedures and usage of surgical instruments. It is claimed that he introduced 200 surgical tools, including knives, probes, scalpels, surgical scissors, grasping forceps and hooks. He is credited with the performance of the first thyroidectomy.

**Phase of Translation from Arabic to Latin**

As stated above, many of the works of these Arab and Muslim physicians were translated to Latin and were used in the Medical schools and universities in Europe for centuries. There were several Europeans who translated Arab texts to Latin. Most famous of those are **Constantine the African (Constantinus Africanus), Gerard of Cremona, Arnaldus de Villa Nova, Dominicus Gundissalinus, Michael Scot, Adelard of Bath and Faraj bin-Salim (Moses Farachi of Dirgent)**. There were three important centers for translation of Arabic texts into Latin: Toledo, Spain; Sicily; and Salerno, Italy. We briefly present the most significant of these translators.

**Constantine the African** (1020-1087), a Benedictine monk, was born in Carthage in modern today Tunisia. He was knowledgeable of Arabic, Greek and Latin. He was invited to join the Schola Medica Salernitana by Alfonso I. Archbishop of Salerno in Italy around1065 in order to aid in the translation of various Arabic manuscripts. He translated 37 books including those of Ibn Sina (Canon), as well as Galen and Hippocrates works.

**Gerard of Cremona** (1114-1187) was born in Cremona, Italy. He went to Toledo in Islamic Spain and learned Arabic. He translated 87 books from Arabic including the works of Abu al-Qasem al-Zahrawi (Albucasis), Al-Razi (Rhazes), Ibn al-Haytham, Al-Farabi, Al-Kindi and many more.
Faraj bin Salim was a Jewish physician from Sicily who translated in 1279 into Latin one of the most significant encyclopedias of Islamic medicine: Kitab Al Hawi written by Al Razi under the title Continens with a glossary. He translated Taqweem al Abdan written by Ibn Jazla, and named it Tacuini Ægritudinum (Tables of Diseases). In addition, he translated Greek texts by Galen.

In conclusions, The Arabic-Islamic civilization was able to carry a successful transmission of Greek and Roman medicine through the translations to Arabic by the Nestorian physicians. It also expanded tremendously the medical knowledge through observation and scientific methods as recorded in the scholarly works of Ibn Sina, Al-Razi, Al-Zahrawi and many others, before passing it to Europe through the translations into Latin by Europeans who learned Arabic in centers in Spain and Italy. Scholars and physicians of various origins, religions, and languages had contributed in the Golden days of the Islamic civilization to the advancement of medicine and many other branches of philosophy and knowledge.