

Innovative Islamic Establishment of First Hospitals in History

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Introduction

The history of Arabian medicine can only be studied satisfactorily in conjunction with the general history of Islam, which began to assume political importance in AD 622. In that year, the prophet Mohammed (PBUH) united the warring tribes of Arabia through common religious and social ideals. This vision enabled the Arabs to conquer half of the known world and to build an empire destined to replace those of Rome and Persia (combined). In the early Islamic and Umayyad period (661-750), the usual folk medicine, which is found in all primitive societies, abounded. The general belief was that for every malady, Allah had appointed an appropriate remedy. There were, however, only three principal methods of treatment: the administration of honey, cupping, and cautery. This practice of medicine gained wide popularity and acquired a great significance, because it was held to be the teachings of the prophet (PBUH) and was thus coined '*Prophetic Medicine*'. However, as IbnKhaldun has shown, that such practices were inseparable from *Bedouin medicine* and it can have no claim to Divine revelation⁽¹⁾. The Prophet Mohammed (PBUH) said:

“Healing is in three things: a sip of honey, a cupping incision, and cauterization. I forbid my nation from cauterization.”

قَالَ ﷺ: (الشِّفَاءُ فِي ثَلَاثَةٍ: شَرْبَةِ عَسَلٍ، وَشَرْطَةِ مَحْجَمٍ، وَكَيْةٍ نَارٍ، وَأَنْهَى أُمَّتِي عَنِ الْكَيِّ)

He also said: **“If there is any good in any of your medicines, it is in a cupping incision, a sip of honey, or a cauterization with fire that suits the disease. But I do not like to cauterize.”**

وقال أيضاً: (إِنْ كَانَ فِي شَيْءٍ مِنْ أَدْوِيَّتِكُمْ خَيْرٌ، فَفِي شَرْطَةِ مَحْجَمٍ، أَوْ شَرْبَةِ عَسَلٍ، أَوْ لَذْعَةٍ بِنَارٍ تُوَافِقُ الدَّاءَ، وَمَا أَجِبُ أَنْ أَكْتُوِي).
Narrated by Sahih al-Bukhari⁽²⁾ (صحيح البخاري)

One might consider honey as symbolic for Medicine (drugs); cupping incision as symbolic for surgery; and cauterization (with fire) as symbolic for Radiotherapy.

However, it was not until the ninth century, with the Hellenization of Islam, that the evolution of a highly sophisticated system of scientific medicine began.

An acrimonious theological dissension in the fifth century was responsible for the preservation of Greek medicine until the fifteenth century. Nestorius, Bishop of Constantinople in 431, was excommunicated by the Council of Ephesus for his denial of the Doctrine of Theotokos (that Mary was the mother of God). The foundation of the Nestorian Church followed his condemnation and subsequent death.

The Nestorians established a successful school of medicine and two hospitals in Edessa, Mesopotamia, but in 489 they were expelled and their buildings razed by the Orthodox Emperor, Zeno, under the influence of Cyril, Bishop of Alexandria. They further established their centres at Nisibis, being warmly welcomed by Chosroes, under whom Persia attained the zenith of its power and culture in the sixth century. He founded a university at *Jundi Shapur* ('*beautiful garden*'), which combined classical learning with Indian philosophy and medicine.

In 636 AD, with the defeat of the armies of the Eastern Emperor, Heraclitus, by Khalid IbnAl-Walid, the '*Sword of God*', the scholars at Jundi Shapur feared the destruction of their school. However, the Muslims were immediately influenced by the classical masters and Jundi Shapur, far from being destroyed, became *the Cradle of the Arabian School of Medicine*.

The Arabs, under the Umayyad Caliphate, had been mainly concerned with their military might and the

expansion of their empire (*Horizontal Expansion*). The succeeding Abbasid Caliphate was conspicuous for its intellectual activity and generous patronage of learning and the arts and ushered in the golden age of Hellenic culture (*Vertical Expansion*). **Baghdad thus, became the metropolis of Islam, where the influence of Jundi Shapur and its physicians, notably the BukhtYishu family, were deeply felt** (Margotta 1967).

The Byzantine Emperor was amazed to discover that the collecting and purchasing of Greek manuscripts were among the terms of peace dictated by the victorious Abbasid Muslim leaders (as a *Jeziya* equivalent). *'It was this people who took from the hands of the unworthy successors of Galen and Hippocrates, the flickering torch of Greek medicine. They prevented its extinction and they handed it back after five centuries'* (Withington 1894) ⁽¹⁾.

It has been frequently quoted that:

- **Medicine was non-existent, but Hippocrates had created it;**
- **Medicine was dead, but Galen had revived it;**
- **Medicine was scattered, but had been collected by Rhazes (Ar-Razi); and**
- **Medicine was incomplete, but had been completed by Avicenna (Ibn Sina).**

(كان الطب معدوماً فأوجده أبقراط، وميتاً فأحياه جالينوس، ومشتتاً فجمعه الرازي، وناقصاً فأكمّله ابن سينا).

Establishment of Hospitals for the First time in History

Hospital foundation and the medical practice are greatly, if not entirely, related to these two Muslim giants in Medicine: **Rhazes and Avicenna**. Their books: *الحاوي في القانون* **Continence in Medicine** (30 volumes), and *القانون في الطب* **Canon of Medicine** (5 volumes) respectively, were both translated into Latin and served as the main Medical textbooks for medical students for many generations and indeed, for many centuries. Each text is a fertile field for unlimited medical and historical research till our present time. Indeed, Rhazes and Avicenna were **the prime movers and shakers in the Medical world (during European medieval ages and beyond); they set the highest professional standards in the hospital's clinical practice as well as in teaching and training of generations of doctors all-over the World for many centuries (from 10th to 18th centuries).**



Rhazes (865–935AD), The Galen of Arabs, and Avicenna (980–1037 AD) The prince of physicians.

Although places for the sick have been around since antiquity, most were very basic, and simply acted as **care houses or buildings for holding ill people**. In early Medieval Europe, the prevalent philosophical belief about illnesses was that they were supernatural, and therefore incurable by human intervention. **This meant hospitals were no more than hospices or hostels in today standards. Little effort was therefore, made to cure the illness, and instead, monks would tend to patients to assure their soul's salvation.**

In Islam, numerous *ahadith* (sayings) of the Prophet Mohammed (PBUH) ⁽²⁾ such as **“God never inflicts a disease unless He makes a cure for it,”** and **“God has sent down the disease and the cure, and He has appointed a cure for every disease, so treat yourselves medically,”** guided Muslim physicians to take an entirely different approach: aiming to actually cure illness and to restore people's health based on solid Medical knowledge and scientific means. Thus, the invention of hospitals was the fruitful outcome of this Islamic philosophy. **Hospitals became places where patients were treated for their diseases by learned professional physicians, as opposed to a place for lodging sick people, run by religious order with prayer and worship to heal their souls from their illness, which is considered incurable and untreatable.**

The first complete hospital in the history was built in 86 Hijri / 705 AD during the era of Umayyad Caliph Walid bin Abdul Malik. However, during Abbasid era, the earliest documented general hospital was built about a century later, in 805 AD, in Baghdad, by the vizier to the **Caliph Harun al-Rashid**. The prominence as court physicians of Bakhtishu' (بختيوش) family, former heads of the Persian medical academy at **Jundishapur**, suggests they played important roles in its development. In 825 AD, the Abbasid Caliph **Al-Ma'mun** founded the **House**

of Wisdom (بيت الحكمة *Bayt al-Hikma*) in Baghdad, modelled after the *Academy of Gondishapur*. Led by the Christian physician *Hunayn ibn Ishaq*, and supported by translated Greco-Roman books by Galen, Hippocrates, Plato, Aristotle *et al.* Over the following decades, **34 more hospitals sprang up throughout the Islamic world**, and the number continued to grow each year. In Kairouan, in present-day Tunisia, a hospital was built in the ninth century, and others were established at Makkah and Madinah. Persia had several: One in the city of Rayy was headed for a time by its Baghdad-educated native son, Mohammed ibn Zakariya al-Razi (**Rhazes**). **In the 10th century five more hospitals were built in Baghdad**. The earliest state-of-the art Teaching hospital was established in the late ninth century by 'Al-Mu'tadid, who asked Al-Razi to oversee its construction and operations.

indirectly hinted at for non-payment. The entire service is through the magnificence of God, the generous one) (6).

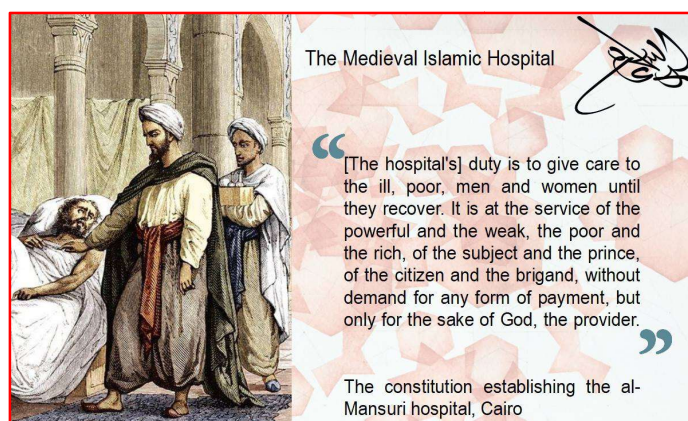
As the hospitals grew in number, the specialties too, increased to cope with various ailments. The medical culture of hospital practice was progressive, until 1258, when the Mongols invaded and destroyed Baghdad, the capital of the Islamic World.

Founding Fathers of Clinical Medicine in Hospital Practice

Among Rhazes and Avicenna, Rhazes chronologically, the first, and the older of the two, and for being the chief physician of Baghdad teaching hospital, deserves a special attention due to his amazing, original, and pioneering achievements in Medicine.

I. Abu Bakr Mohammed ibn Zakariya al-Razi (Rhazes or Rasis, 865–925 AD), can therefore, be considered the original and real **Father of Clinical Medicine and Clinical Teaching**. Due to his popularity as a physician, al-Razi was invited to Baghdad to be the director in a new **Mu'tadid hospital** to be (named after its founder **Caliph Al-Mu'tadid** (d. 902 CE). Under the reign of Al-Mutadid's son, **Al-Muktafi** (r. 902–908) al-Razi was commissioned to build that hospital as the largest Teaching Hospital of the Abbasid Caliphate. To pick the future hospital's location, al-Razi adopted what is nowadays known as an evidence-based approach by hanging fresh meat in various places throughout the city of Baghdad, and to build the hospital where meat took longest to rot. **He spent the best of his years practising, experimenting, teaching, and writing in that Baghdad Teaching Hospital** which provided for him the fertile field for research and clinical activities (**seed and soil**), none of which could have been flourished had he stayed in Rey. **Rhazes therefore, should be considered as a genius Baghdadi scholar, not merely a Persian doctor!**

What has been said about Rhazes' criticism of religion are fragmentary and only reported by authors who were often hostile, and jealous of him. He was in fact the author of (**the servant has a Creator** "إن للعبد خالقاً"); he was highly praised by Imam al-Thahabi in (**Biographies of the Noble Figures** سير أعلام النبلاء). Rhazes spent the last years of his life in his native Rey suffering from glaucoma. His eye affliction started with cataracts and ended in total blindness. Allegedly, he was approached by a physician offering an ointment to cure his blindness. Al-Razi then asked him how many layers the eye contains, and when he was unable to receive an

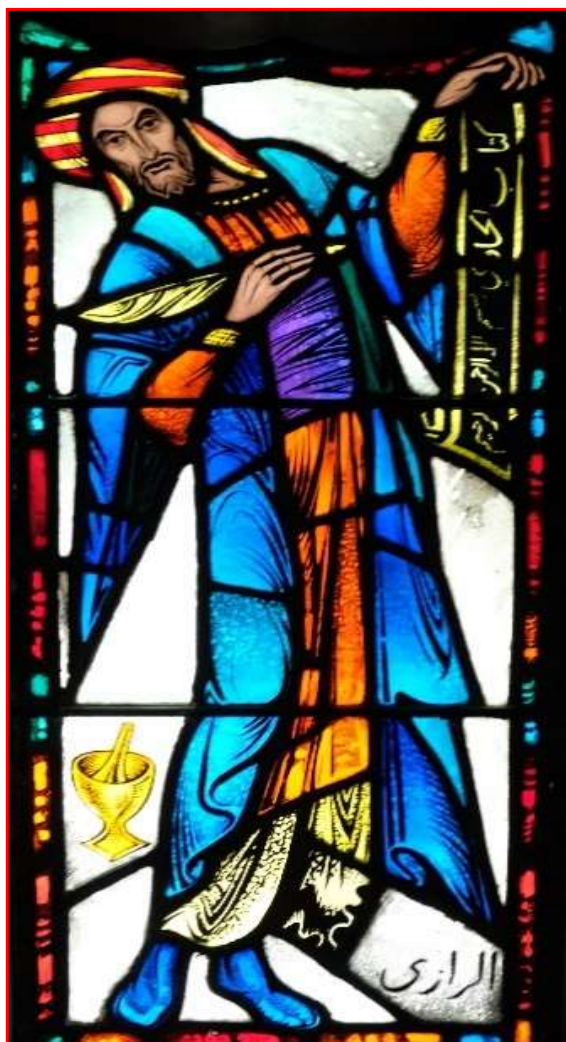


By the 12th century, hospitals serving the sick and the poor could be found in nearly every Islamic city. Read the following excerpt from the constitution establishing the al-Mansuri hospital, thought to be the First hospital dedicated for psychiatric patients. The al-Mansur Qalawun Complex in Cairo dates from 1284-85.

Each hospital included oculists (ie, ophthalmologists), physician/surgeons, and bonesetters (3, 4, 5). The policy statement of the “bimaristan of al-Mansur Qalawun” in Cairo, circa 1284 ce:

(The hospital shall keep all patients, men and women, until they are completely recovered. All costs are to be borne by the hospital whether the people come from afar or near, whether they are residents or foreigners, strong or weak, low or high, rich or poor, employed or unemployed, blind or signed, physically or mentally ill, learned or illiterate. There are no conditions of consideration and payment; none is objected to or even

answer, he declined the treatment stating **"my eyes will not be treated by one who does not know the basics of its anatomy"**



This stained-glass window in Princeton University Chapel commemorating the contributions of Rhazes (Al-Razi) to Medicine

(Galen of Arabs) Arabic inscription on the right upper side reads: كتاب الحاوي بسم الله الرحمن الرحيم. Below is the name الرازي. This reveals that in Islam, there is a conformity and harmony (with no clash) between the religion and the science.

In fact, Al-Razi (Rhazes) should be considered the pioneer and the father of many fields of Medicine:

1. Father of Clinical Medicine and Clinical Teaching

His most extensive medical work, consisting of 30 volumes, which is also the largest known medieval encyclopaedic medical text, is *Kitab al-Hawi fi al-Tibb (The Comprehensive Book of Medicine; and in Latin The Liber Continens)*. In this, he illustrates the opinions, diagnosis and method of treatment of all

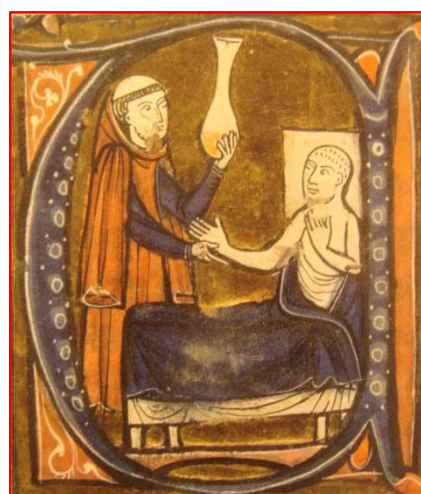
medieval and Greek predecessor physicians, authenticated by his own experiments and observations, thus providing the reader access to a number of discussions^(7, 8).

Likewise, *Al-Mansuri fi al-Tibb (The Book on Medicine for Mansur)* was another famous medical treatise dedicated to a ruler and later used widely as a medical teaching curriculum for medical students⁽⁹⁾.

He was the outstanding physician, pharmacist, chemist, and philosopher in the medieval ages. There are many discoveries in pharmacy and chemistry, such as ethanol and sulfuric acid, attributed to Rhazes. Furthermore, he had many clinical achievements in medicine, such as ophthalmology, neurosurgery, paediatrics, as well as the treatment of kidney diseases, infectious diseases, hydrocephalus, facial palsy, measles and smallpox. Rhazes also contributed to the surgical procedures performed in the airway including tracheostomy.

Later, he was invited back to Rey by the governor of Ray: Mansur ibn Ishaq and became a bimaristan's head. He dedicated two books on medicine to Mansur ibn Ishaq: *The Spiritual Physic and Al-Mansuri on Medicine*.

He established the methodology of clinical medicine by having a rational approach to the care of patients based on recording, interpreting and classifying his clinical and experimental observations. He also pioneered practising case control experimentation in clinical medicine⁽¹⁰⁾.



European depiction of Rhazes (Mohammed bin Zakariya Al-Razi) in Gerard of Cremona's "Recueil des traités de médecine" circa 1250-1260. He is holding a flask of urine in left hand and examining patient's pulse with right hand.

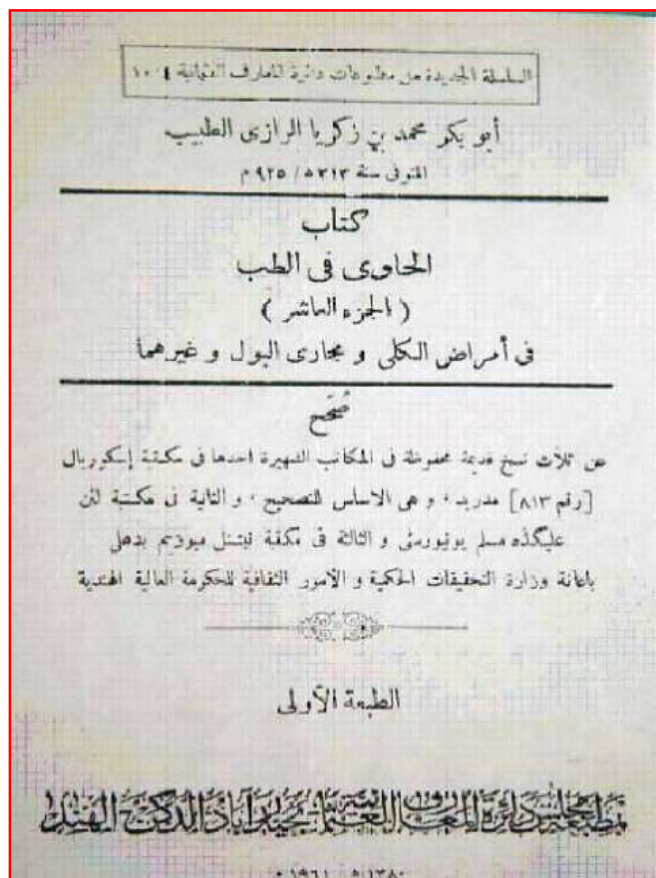


In Islamic Hospitals, Muslim doctors were the first to perform Initial bed checkup diagnosis on patient's entry to Hospital. Temperature is checked using palm, pulse measured using fingertips, liver and abdomen checked by hand and by hollow tube (the first stethoscope), and patient flask of urine inspected to make such a diagnosis. Europe adopted this system of clinical examination after 6 centuries.



'ContinensEncyclopedia' by Rasis in Latin (MAGNIFIED).

Notice in the bottom, the consuctive names of 5 giant names in Medicine (3 Arab/Muslim doctors and 2 Greek doctors): Mesve [Yohanna bin Massawayeh], Avicena [Ibn Sina], Hipocrates, Galenus, and Rasis [Abu Bakr al-Razi]. (From: Il Continens edito a Venezia nel 1529 presso Ottaviano Scoto - Monza ca. 1440 - Venezia 1498)



Kitab Al-Hawi was translated into Latin by a Sicilian Jewish scholar **Faraj Ibn Salim** in 1279 under auspices of Italian King Charles I of Anjou (1220-1285) as: **Liber Continens**. This enormous twenty volume medical encyclopedia was the largest ever composed by one person. A Latin edition was printed in 1486 under the title **Liber dictus Alhavi**, the last edition printed in Venice in 1542. **By 1866, 40 editions had been printed in Europe.** A copy of the Latin translations is stored in Kings College library at Cambridge University. *Al-Hawi* was published in Arabic text from Hyderabad, India in 1955.

2. Father of Experimental Medicine, because of his experimental laboratory attached to Baghdad Teaching Hospital, where he isolated for instance, alcohol for use in wound therapy of patients. Al-Razi studied chemistry in his youth and wrote on the subject. He followed **Jabir ibn Hayyan** and **Al-Kindi**, however, his approach to the subject was remarkably distinctive, for it was based on careful and accurate experimental observations. He classified the materials used in chemistry into three main categories: bodies, souls and spirits. He subdivided the substances into **animals (hayawanat)**, **plants (nabatat)** and **minerals (jamadat)** ^(11, 12).

Al-Razi was the first to introduce animal trial studies to examine the effects and toxicity of drugs prior to human administration ⁽¹³⁾.

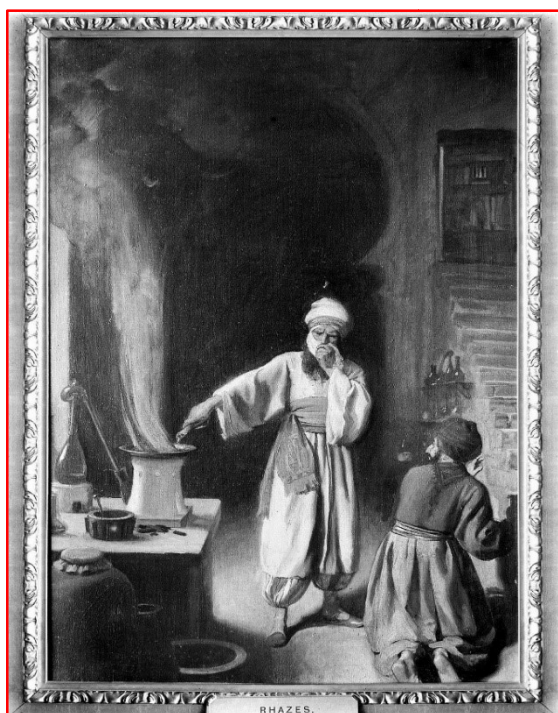
Invention of Medical Alcohol: Though alcohol distillation dates back to early 2000 BC in Indus Valley Civilization, *but* the first use of alcohol as a medical disinfectant was during the Islamic Golden Age. The demand for medical alcohol (70% or more to kill the virus) and hand-gel has greatly increased since the start of COVID-19 pandemic. It was Al Razi who made this discovery and published it in his medical encyclopaedia “**Al Hawi**” (**The Continece or Comprehensive Book on Medicine**), where he described the antiseptic properties of alcohol and its effectiveness on wounds.

The method was first implemented in the First hospital in Baghdad and soon spread across the Islamic world. Europeans later adopted the original Arabic name. Latin alcohol from Arabic *alkoh'l – al, the, koh'l*, fine powder of antimony used in the East to stain the eyelids. But more correctly, it is Arabic for *alkohool, or alghool*, the substance that when drunk, will take off your mind. See Verses 37:45-47 of Surat As-Saffat (Those Ranged in Ranks) of Qur'an: “**Round will be passed to them a Cup from a clear-flowing fountain. Crystal-white, of a taste delicious to those who drink (thereof). Free from ghawl (headiness); nor will they suffer intoxication therefrom.**”

الكحول أو الغول: المشروب الذي يذهب (يغتال) العقل (إذا شرب). قال الله تعالى: " يُطاف عليهم بكأس من معين. بَيْضَاءَ لَذَّةٍ لِلشَّارِبِينَ. لَا فِيهَا غَوْلٌ وَلَا هُمْ عَنْهَا يُنْزَفُونَ " سورة الصافات 45-47. ⁽¹⁴⁾

Invention of Soap: Handwashing and the importance of the use of soap have been drilled by health officials from the onset and during COVID-19 pandemic. **World Health Organisation** published reports on the importance of washing hands with soap to prevent the disease. Bathroom soap bars like the ones used today, date back to the 10th century Middle East, during the ‘**Islamic Golden Age**’. Recipes for soap-making were developed by the Muslim physician, and chemist Abu Bakr Al Razi, (Rhazes or Rasis). The production of soaps dates back to 13th century’s Middle Eastern and North African cities of Fez, Nablus, Damascus, and Aleppo (Syria) as one of the principal exporters of soap to the rest of the Islamic World, and Europe. Word soap borrowed from Germanic word *sapo*, which has evolved into French *savon*, as probably related to French city *savon* where French soap was manufactured. Italian *sapone*, Spanish *jabon*, From Arabic *sabon* manufactured from oil or fat with alkali (felt as hot dry and refreshing to the body) and cut as a solid block held by hand to clean and refresh the skin, and to clean the dirty cloths] ⁽¹⁴⁾.

Rhazes used **cat gut lute strings** for abdominal wall repair; he also utilized **horsehair suture**, for patients (a practice persisted thereafter, for centuries). **In animal research**, Rhazes was a pioneer in testing his theories on animals and presenting the concept of experimental medicine ⁽¹⁵⁾. He did animal experimentations with new drugs, checked out their effects and toxicity before prescribing the medicine to his patients ⁽¹⁶⁾. It is thought that he carried out experiments on animals to assess the effects of the drug and its side effects. As an example, he investigated the effect of quicksilver on apes ⁽¹⁷⁾. He was the first to investigate the therapeutic effects of a drug using experimentation on animal subjects. He wrote: *“Although, I was aware of the impact of pure mercury on the human stomach, I reviewed its impact on monkeys and monitored its use in patients with intestinal blockage”* ⁽¹⁸⁾.



Al-Razi (Rhazes) in his laboratory (orientalist painting by Ernest Board, c. 1912)

Al-Razi at work. WELLCOME COLLECTION/CC BY 4.0

3. Father of Medical Ethics,

For his (Treatise on Doctor's crisis, and how his status should be with his psyche, physique, manners, and ethics). (رسالة في محنة الطبيب وكيف ينبغي أن يكون حاله في نفسه وبدنه وسيرته وأدبه)

One of great sayings of Al-Razi CE 865-925:

‘The doctor's aim is to do well, even to our enemies, so much more to our friends, and my profession forbids us

to do harm to our kindred, as it is instituted for the benefit and welfare of the human race, and God imposed on physicians the oath not to compose mortiferous remedies.’ ⁽¹⁹⁾.

He thus, sets the highest professional standard for physicians by maintaining the respect and confidence of the patients with a high level of integrity.

He had firm faith that doctors are entrusted by God Who had blessed them with the sacred endeavour to provide the best treatment to all who require it, without discrimination against enemies or deprived ones who couldn't afford medical attention ⁽²⁰⁾. **He therefore treated the poor patients free of charge and many patients came from afar to seek his expertise** ⁽²¹⁾.

4. Father of Psychology, Psychotherapy & Psychosomatic Diseases. Razes was among the first in the world to write on mental illness and psychotherapy. As chief physician of Baghdad hospital, he was also the director of one of the first psychiatric wards in the world. Two of his works in particular, *El-Mansuri* and *Al-Hawi*, provide descriptions and treatments for mental illnesses.

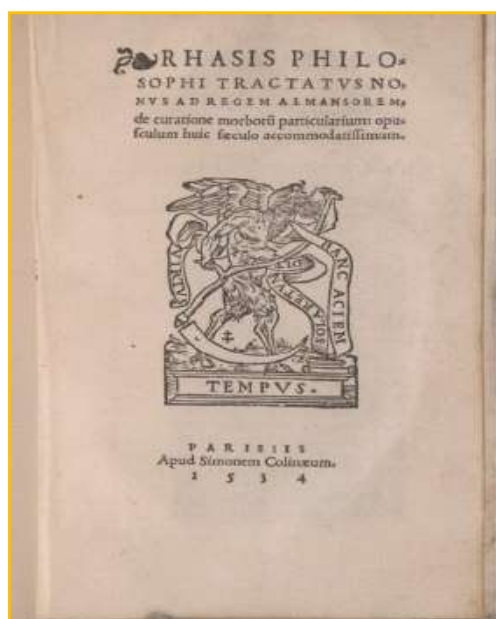
To encounter the mental health illnesses of his patients, he considered treating patient's behavioural disorders as medical conditions and presented the very first concept of psychiatric wards. He is known to have practised an early form of cognitive therapy for obsessive behaviour and depression ⁽²²⁾.

5. Father of paediatrics and infectious diseases. His book *Kitab al-Judariwa al-Husbah (The Book of Smallpox and Measles)* became the first scientific description for the recognition and differentiation of smallpox and measles. In 1970, the World Health Organisation credited his work by stating, *‘His writings on smallpox and measles show originality and accuracy, and his essay on infectious diseases was the first scientific treatise on the subject’* ^(23, 24). For centuries his treatise, together with those of Avicenna's *Canon of Medicine* were used as primary texts for major medical schools in Europe.

6. Father of Allergies & immunology.

“Resale Shammieh” is one of Rhazes' pioneering works in medicine; replying to Shahid-Ibn-Hussein Balkhi, dedicated to his master Abuzeid Ahmad-Ibn-sahl Balkhi, who was getting cold in spring at the time of rose blossoming.

(مقالة في العلة التي من أجلها يعرض الزكام لأبي زيد البلخي في فصل الربيع عند شمه الورد- أو الرسالة الشمية).



Latin translations of Kitab al-Mansoor consist of 10 treatises, the 3rd one is devoted to diets, drugs, cereals, dairy products, fruits and legumes. The 8th treatise is on toxicology and therapeutics. In treatise (maqala) number 10, Razi gave names of 13 types of fevers. This book was translated into Latin as: **Liber ad Almansorem** by Gerrard of Cremona.



As the chief physician of Baghdad hospital, Al-Razi treated many patients, writing the first known description of smallpox. His book: *al-Judariwa al-Hasbah* الجذري والحصبه (On Smallpox and Measles) was the first book to differentiate smallpox from measles as two distinct diseases. His book *ما الفرق* ما الفرق (What is The Difference) is considered the first book on differential diagnosis of diseases in the Medical History.

Review of “Resale Shammieh” and similar works cited by Abureihan Birooni, Ibn Abi-Ossaiba’ei, Ibn-e-nadim, revealed that this treatise has been prepared before treatise of Qest-ibn-Looqa, written for Abbasid Caliph Mutawakkil, about hay fever. Rhazes, in “Resale Shammieh” elucidated almost **all clinical manifestations of allergic rhinitis and hay fever** mentioned in classical modern medical textbooks, including nasal stuffiness, itchy nose, sneezing repeatedly, runny nose, red face, and light elevated temperature of the body. He also cited complications of hay fever such as hoarseness, dyspnoea and fever; and mentioned primary preventive measures including covering the head in cold weather, abstaining from drinking cold water as well as smelling musk, Costus and myrrh Maki. His proposed remedies for hay fever comprising of dipping a fabric in the nose, fumigation, shaving the head and rubbing mustard and allium on it, as well as ear or forehead bloodletting⁽²⁵⁾.

7. Father of Domiciliary Medicine.

For his pioneering **كتاب من لا يحضره الطبيب Kitab man la Yahduru al-Tabib**.

Being so generous and charitable, Al-Razi wrote a book entitled **Kitab man la Yahduru al-Tabib (The Manual: A Medical Advisor for the General Public)**, providing medical care to ordinary citizens, travellers, and the poor who were unable to afford a physician.

8. Father of Medical Critique (or Critique in Medical Practice). For his pioneering unprecedented book (شكوك على جالينوس **Doubts about Galen**).

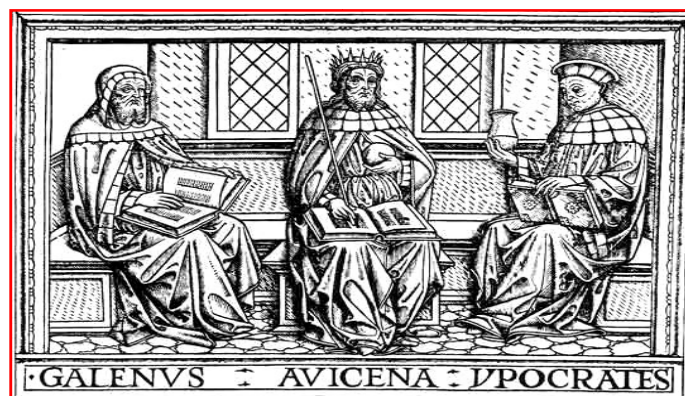
In the 2nd century, the ancient Greek physician Galen wrote extensively on medicine and the anatomy of the human body based on animal dissection. Galen was considered among the leading thinkers of medicine and remained the best-known physician for hundreds of years after his demise. Despite his ideas being revolutionary in his time, many were later proven seriously flawed. Al-Razi, while acknowledging and expressing his admiration of Galen’s contributions, became the first person to critically challenge his concepts. In his book *Doubts about Galen*, he writes ‘...In medicine and philosophy blind obedience and surrender to authority is unacceptable and imitation is not wisdom, but that reason and logic must guide one’s thoughts, and Galen himself had chastised those who attempt to impose their opinions on their students without reason or logic.’^(26, 27).

Overall, Rhazes was known as an empiricist and emphasized clinical observations more than philosophical

views⁽²⁸⁾. Rhazes' ethical views in medicine Rhazes made a great contribution to spiritual medicine and believed in ethical issues. Al-Razimade comments and constructive scholarly criticism on the theories of Galen, the Greek master. Moreover, he gathered all of his opinions in the book (**Shukuk ala Jalinoos- The Doubt on Galen**), relating to Galen⁽²⁹⁾. This book was successful in the presentation of Rhazes' views on the Galenic experiences. Rhazes rejected Socrates and Aristotle's theories about mental health⁽¹⁶⁾. He opposed their theories on the formation of the ventricles, spinal cord, and the brain in pairs. Rhazes expressed that hemiplegia is related to ventricular involvement in opposition to theory of Galen^(21, 25).

Commemorative stamps were issued by many countries in honour of his work, and his portrait hangs in the hall of the School of Medicine in Paris. There is no doubt that Al-Razi was therefore one of the greatest physicians of Islam and of the Medieval ages.

II. Avicenna (980-1037 AD) was born in 980 near Bukhara (now in Uzbekistan). He is often described as "The Father of Early Modern Medicine" **أبو الطب**, "The Sheikh Al-Rais (The Chief Boss) **الشيخ الرئيس**", "The Prince of Physicians **أمير الأطباء**", and "The Aristotle of Islam **أرسطو الإسلام**". Avicenna never practiced in Baghdad. Avicenna was an astronomer, chemist, geologist, logician, paleontologist, mathematician, physicist, poet, psychologist, scientist, and teacher. He followed Muslim principles and thought and memorized the Quran by the age of ten, and as an adult, wrote the *Proof of Prophecies*, in which he comments on several Quranic verses and holds the Quran in high esteem. Avicenna argued that the Islamic prophets should be considered higher than philosophers. Avicenna is aligned with the Hanafi school of Sunni thought. Avicenna studied Hanafi law, many of his notable teachers were Hanafi jurists, and he served under the Hanafi court of Ali ibn Mamun. Avicenna said at an early age that he remained "unconvinced" by Ismaili missionary attempts to convert him. Avicenna made an argument for the existence of God, known as the "Proof of the Truthful" (*wajib al-wujud*), and he identified it with God in Islam. Avicenna had correspondence with al-Biruni who asked 18 questions, 10 of which were criticisms of Aristotle's (*On the Heavens*). Some of Greek philosophy in metaphysics (*ilāhiyyāt*) put him in antagonism by al-Ghazali, ibn Taymiyya, and ibn Qayyim al-Jawziyya; it is quoted that Avicenna repented and revoked these Greek ideas before his death (see below).



الشيخ الرئيس ابن سينا يتوسط أبقراط والحكيم وجالينوس العظيم

George Sarton, the father of history of science, wrote in the Introduction to the History of Science: "One of the most famous exponents of Muslim universalism and an eminent figure in Islamic learning was Ibn Sina, known in the West as Avicenna (981-1037). For a 1000 years, he retained his original renown as one of the greatest thinkers and medical scholars in history. His most important medical works are the *Qanun* (Canon) and a treatise on Cardiac drugs.

The '*Qanun fi-l-Tibb*' is an immense encyclopedia of medicine. It contains some of the most illuminating thoughts pertaining to distinction of mediastinitis from pleurisy; contagious nature of phthisis (tuberculosis); distribution of diseases by water and soil; careful description of skin troubles; of sexual diseases and perversions; and nervous ailments.



Ibn Sina (Avicenna) is a genius physician, surgeon, prolific academic writer and Philosopher.

In addition to his book (Canon of Medicine), his '*Book of Healing- كتاب الشفاء*' became available in Europe in a partial Latin translation 50 years after its composition. He discovered the contagious nature of infectious diseases, introduced Quarantines, and studied the influence of the climate and environment on health. He is also considered the founder of the fundamental concept of momentum in physics. Avicenna was also the pioneer of neuropsychiatry, describing numerous conditions including hallucination, insomnia, mania, nightmares,

melancholia, dementia, epilepsy, paralysis, stroke, vertigo, and tremor. In 1037, while Avicenna was accompanying prince (Ala al-Dawla) to a battle near Isfahan, he contracted a severe colic, having suffered from colic throughout his life (most likely he suffered from ulcerative colitis). He died shortly afterwards in Hamadan in 1037, where he was buried. It is documented by **ibn Khillikan** that ibn Sina in his last days during his illness before his death, had said: (*The manager in my body is unable to manage it, so treatment will not benefit me*); he then, washed himself [in the bathroom] and repented, and he gave all his possessions as charity to the poor, restored the grievances (the rights and debts) to those he knew, freed all his servants (slaves), and began to complete recitation of the Holy Qur'an once every 3 days. Then he died.

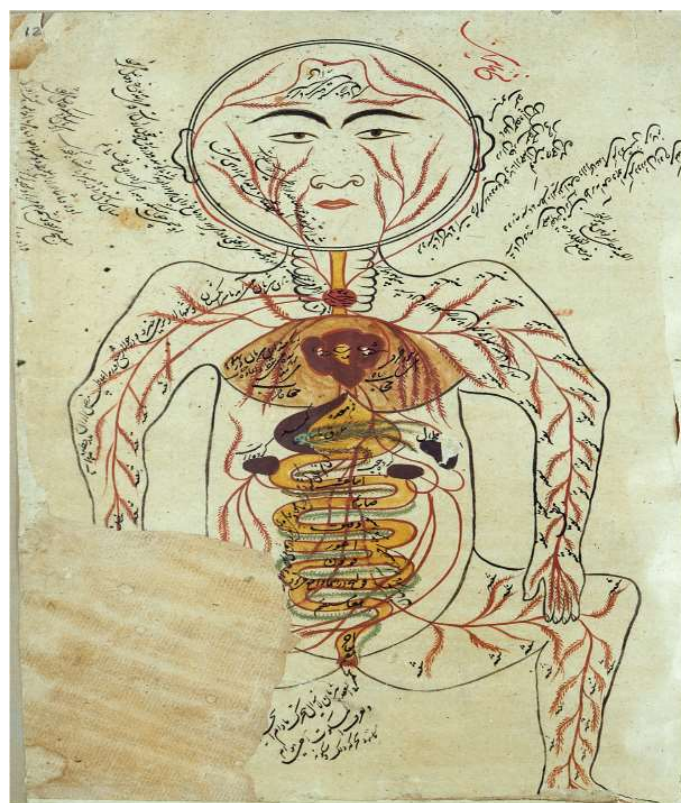
(ذكر ابن خلكان في ترجمته من وفيات الأعيان ما حصل له من مرض في آخر حياته، ونقل عنه أنه قال: المدير الذي في بدني، قد عجز عن تدبيره، فلا تنفعني المعالجة، ثم اغتسل وتاب، وتصدق بما معه على الفقراء، ورد المظالم على من عرفه، وأعتق ممالিকে، وجعل يختم في كل ثلاثة أيام ختمة، ثم مات) .



Avicenna at the sickbed, miniature by Walenty z Pilzna, Kraków (c. 1479–1480)

Avicenna pioneered many innovative techniques in Medicine, for instance, subcutaneous injections of drugs, managing skeletal abnormalities by strong skeletal tractions, description of meningitis, discovery of consciousness and unconsciousness, and discovery that brain stroke can result from too much blood

(haemorrhage from hypertension), not only from too little blood as thought before. Avicenna's dissection of human body revealed many genuine original observations of anatomy, for instance, his discovery that infant takes nutrition from maternal placenta through 2 arteries and one vein, his description of optic chiasma, his description of human arterial blood supply, and indeed visceral blood supply of the digestive system(not dissimilar from our modern anatomy)⁽³¹⁾.



An illustration of human arterial blood supply and visceral blood supply (including the stomach and intestine) by ibn Sina (Avicenna). Credit: L0008560 Arteries and Viscera (according to Avicenna) [Photograph] from MS Arabic 155 (page 259), available from the Wellcome Collection (<https://wellcomecollection.org/works/mssuvf7d>) and licensed under CC BY 4.0 (<https://creativecommons.org/licenses/by/4.0/>)

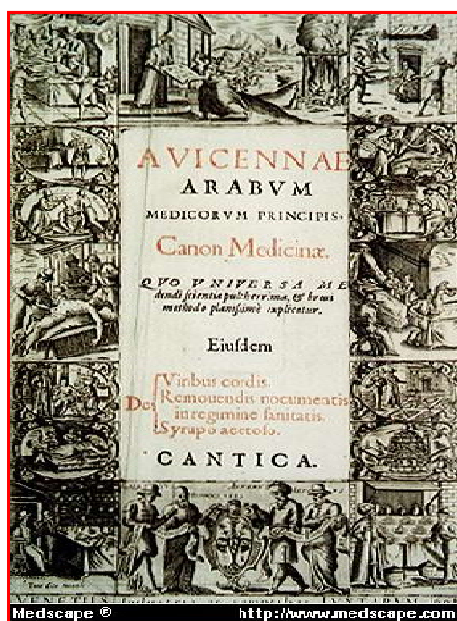
Avicenna's "Canon of Medicine –Al-Qanon fi Al-Tib" (1030) is his greatest Medical legacy:

This book (in 5 managed volumes) is much shorter and abridged encyclopedia of Medicine than 30-unmanaged volumes of Rhazes' "Continence in Medicine"; therefore **Avicenna's 'Canon'** became the alternative replacement for Rhazes' "Continence"(although both were used in Latin translations), and was used as the main reference textbook for all medical students in European

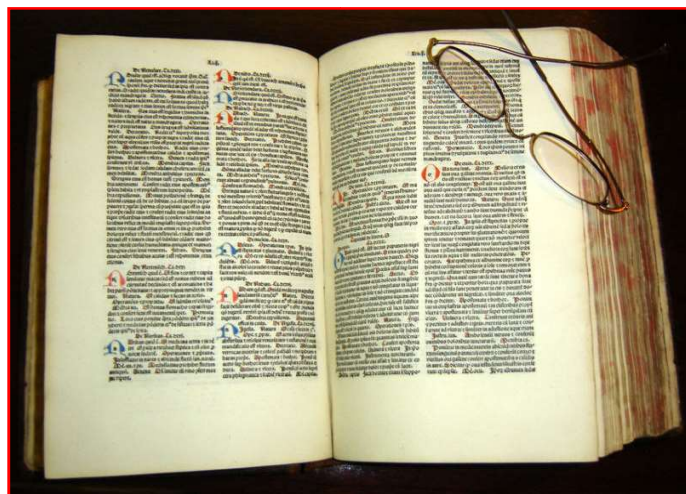
Universities since medieval ages and beyond for 5 consecutive centuries, till mid-18th century. In 12th century, Canon was translated into Latin at Toledo; parts of which were translated to French, German, and English.



The oldest copies of the second volume of "Canon of Medicine" (1030) by Abu Ali Ibn Sina, known in the West as Avicenna (980-1037). The Institute of Manuscripts of Azerbaijan National Academy of Sciences.



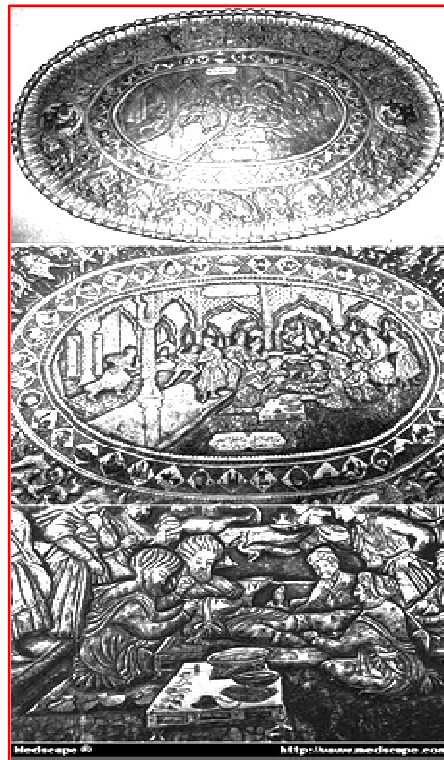
The title page of an ancient edition of the Canon of Medicine (Venice, 1608), translated into Latin. This copy is available in the library of the Humboldt University, Berlin, Germany.



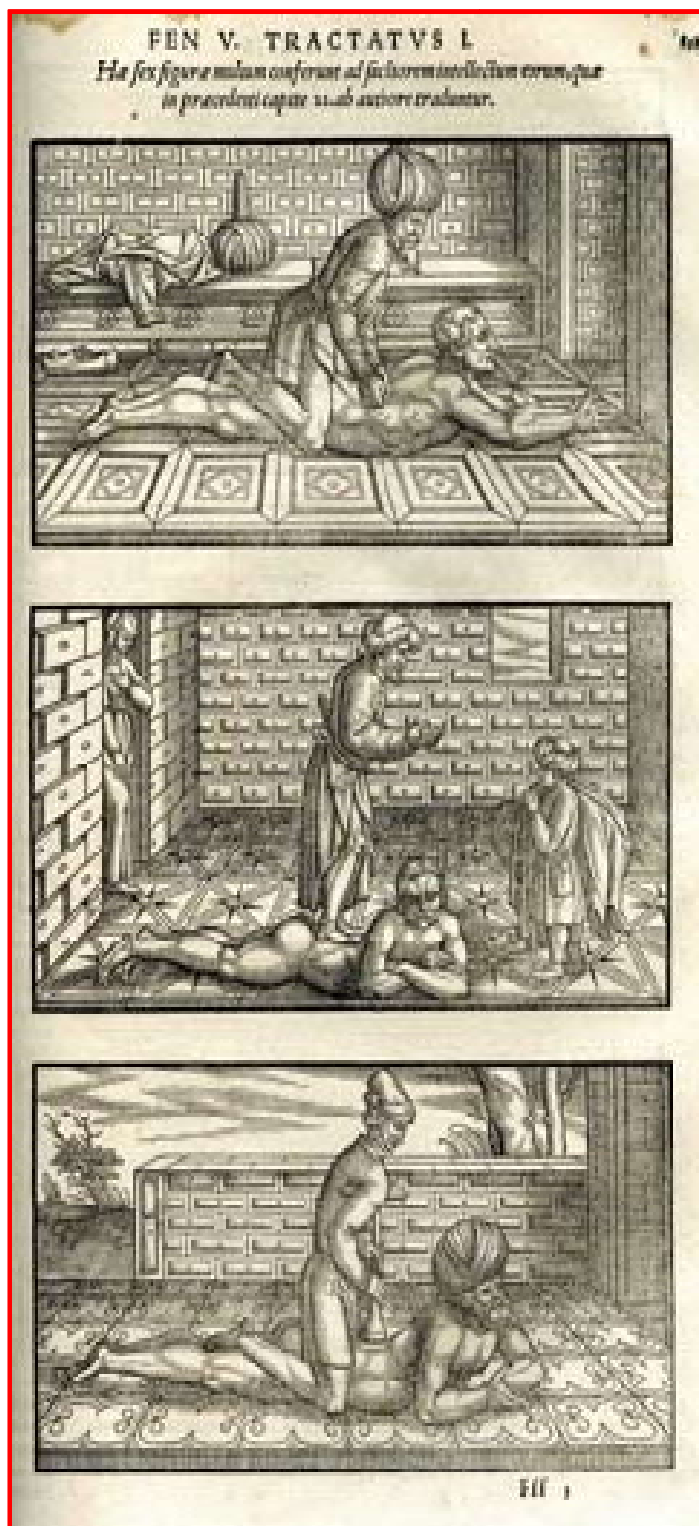
Canon of medicine from Avicenna, Latin translation, dated 1484 CE.

Neurosurgery and Musculoskeletal Management

Avicenna's bold contributions to neurosurgery and to musculo- skeletal disorders are amazingly bold and breakthroughs in his era (as illustrated in the associated portraits).

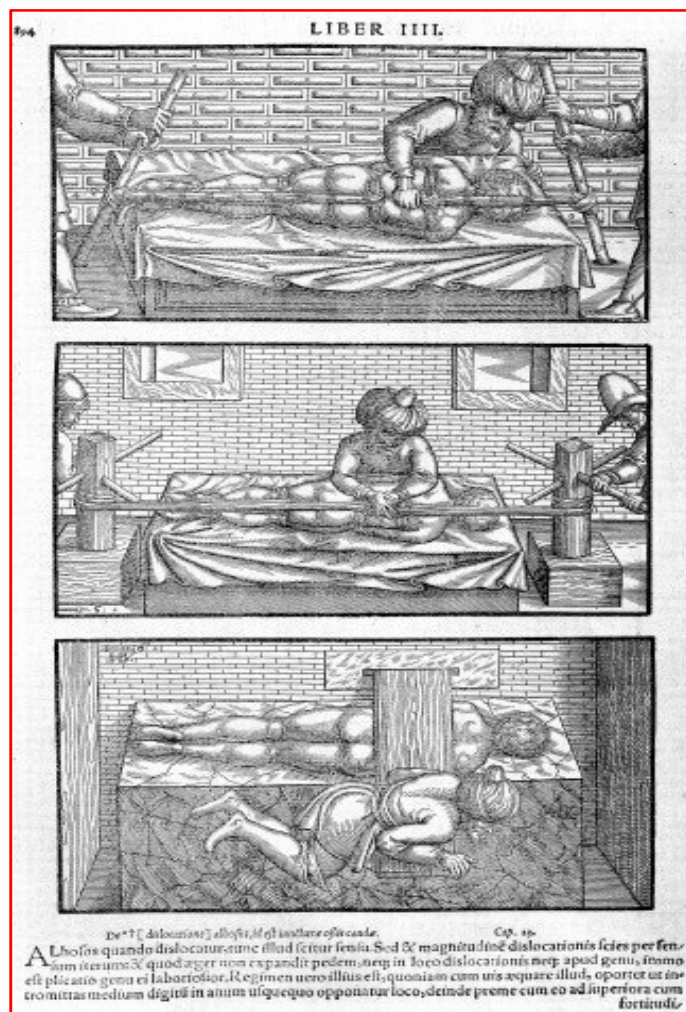


Ibn Sina is performing a neurosurgical procedure, probably a burr-hole trephination on a king. Patient's eyes are closed and his head is fixed; surgical instruments are seen on a small table. The assistant is sitting to the left of Ibn Sina. Three men are holding both arms and legs of the patient.



A sequence of different treatment options for lumbosacral pain (revealing massage by hands, by walking on the back, and by virtue of body and weights), as described in Book 1 of the Canon of Medicine.

Illustrations are taken from the 1608 Latin edition published in Venice.



Illustrations showing skeletal traction, dislocation and correction of spine deformities from Liber canonis, de mediciniscordialibus, etcantica by Avicenna Published: J. Hervagius Basle 1556, pages 893-94. Credit: Wellcome Library/Wellcome Images, London. Copyright.

Quarantine is another Greatest Medical legacy of Ibn Sina who invented it in communicable diseases. Caliph Omar Ibn Al-Khattab was first to implement the medical isolation based on the instruction of the Messenger of God (PBUH) saying: [if an epidemic (plague) befalls a land, do not enter it, or leave in order to escape from it (i.e. from the epidemic or the plague)]⁽³⁰⁾.

This principle was further expanded by Ibn Sina; and it is now agreed internationally that it was Avicenna, in his **"Canon of Medicine"**, who first described the method of **"al-Arba'iniya"** – the fortieth – i.e., a 40-day isolation to prevent the spread of contagious diseases. Ibn Sina was the first to designate this method to avoid contagion through 40-day sanitary isolation. Quarantine was a

mandatory practice in hospitals across the Islamic world to prevent the spread of leprosy, an infectious disease that causes disfiguring skin sores.

Quarantine became more common in Europe, especially in the meeting points of trans-continental merchants, such as Venice, during and after the Black Death plague in the 14th and 15th centuries. The success of the method in controlling the spread of epidemics led to the survival of the term “quarantine” until today. Ibn Sina’s method name “al-Arba’iniya” (the fortieth), translated literally to “**Quarantena**” in early Venetian language, and word **Quarantine**, is used since mid-17th century: from the Italian quarantina ‘forty days’, from Late Latin **quaranta** ‘forty’. Latin **quadráginta** means (“Four Tens, 40”)

“**Quarantena**” designated the 40-day period that all ships were required to be isolated before passengers and crew could go ashore. **Quarantine** considerations are often one aspect of ‘**Border Control**’ applied to visitors and tourist coming by **ships, cars and aeroplanes**.

In the spread of disease, **isolation** refers to separating sick individuals from society in order to contain the spread of the infection. **Isolation** has roots in the Latin word for “**island**,” **Quarantine** refers to separating and restricting the movements of healthy individuals who may have been exposed to an illness to determine whether they are sick (and would require **isolation**). It is often used in disease, preventing the movement of those who may have been exposed to a transmissible disease, but yet undiagnosed. It is distinct from **Medical isolation**, in which those confirmed to be infected with a communicable disease are isolated from the healthy population. Quarantine now designates all types of sanitary isolation, even when the duration is not forty days.

The contemporary term “**quarantine**” still refers to all forms of isolation against disease.

Quarantine has been considered as one of the most effective ways to limit the spread of COVID-19 (**Coronavirus pandemic**) in 2020. Almost all countries have national lockdowns to reduce the number of infected cases. There is an Uzbek film produced in 1957 (in Russian, when Uzbekistan was still a republic within the Soviet Union). It shows the scientist, physician and the thinker **Ibn Sina** (a Muslim father of modern medicine), 1000 years ago, telling people the measures to be taken when there is an outbreak of a pandemic

disease. [Ibn Sina (Avicenna) was born in the city of Afshona, Izbekistan]

. (<https://en.m.wikipedia.org/wiki/Avicenna>)



This coin was minted in 1980 by UNESCO in the honour of Avicenna’s 1,000th birth anniversary (980-1037), as signified on the front of the coin (Avicenna. Reproduced on the reverse is a phrase by Avicenna in Arabic and Latin which means, “Cooperate for the Well-being of the Body and the Survival of the Mankind” together with Avicenna’s signature.

The medallion was made available in gold, silver and bronze – this one is bronze.

The designer was V. Douek, and the medal measures 2 3/8 inches in diameter.

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