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Medical Education in the Abbasid Era: From Mentoring to Qualifying Examinations

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Abstract

The Abbasid era heralded a significant epoch marked by remarkable advancements in various scientific disciplines, notably medicine. Successive rulers of this era embarked on a competitive endeavor to leave indelible marks on the progression of both arts and sciences. This paper aims to elucidate the historical trajectory of medical education during this period, elucidating how eminent physicians orchestrated the establishment and management of hospitals while imparting their expertise to aspiring medical practitioners. Much of the foundation of contemporary medical education, encompassing bedside instruction, informed patient consent, resident training incorporating rounds and clinical documentation, culminating in comprehensive qualifying examinations and professional supervision by regulatory entities, can trace its roots back to the Abbasid era.

Keywords: Abbasid, Education, Medicine, Teaching, Hospital.

INTRODUCTION

During the Abbasid era, remarkable advancements in medicine that shaped the course of medical history took place. Rooted in a rich tapestry of cultural exchange and scholarly inquiry, medical practices during this period were characterized by a synthesis of ancient wisdom, innovative discoveries and a profound commitment to human welfare.

Preceding the establishment of formal medical institutions, pre-Islamic Arabia witnessed basic medical practices rooted in herbal remedies, dietary regulations and the therapeutic use of honey. Simple surgical procedures, such as cautery (blistering), abscess drainage, bloodletting and limb amputation, also found application (Al-Sergany, 2009). Notably, early Muslim societies demonstrated an understanding of disease transmission, as evidenced by prophetic admonitions advocating caution amidst epidemic outbreaks. In a *Hadith* [saying حديث] attributed to Prophet Muhammad [وسلم عليه الله صلى محمد]once told by traders, that a certain disease was killing many people, he said, "If you get wind of the outbreak of plague in a land, you should not enter it; but if it spreads in the land where you are, you should not depart from it" (Al-Nawawi, 2007).

Prior to the establishment of their own medical institutions, the Islamic world inherited and repurposed many existing hospitals, notably the Medical Academy in Gundeshapur [جنديسابور], Persia, a city established originally to accommodate prisoners after the wars with the Romans. Under caliphal patronage and through *waqf* [endowments وقف], a network of hospitals proliferated across the Abbasid Empire, spearheading advancements in medical education and patient care (Horden, 2005).

Islamic teachings, underscored by Quranic injunctions and prophetic sayings, underscored the sanctity of human life and mandated compassionate care for the infirm, as articulated in the Quran in the *Surah* [chapter سورة] entitled *Al-Ma'ida* [the Table المائدة], "Whoever kills a soul unless for a soul or for corruption (don) in the land, it is as if he had slain mankind entirely and whoever saves one, it is as if he had saved mankind entirely" (The Quran 5:32).

In fact, Islam places great importance on social order and civic duties. William Leslie Courtney states, "but what drove the Abbasids to establish these hospitals and to work so hard in the study of medicine? The answer lies within the ethics of their religion, which placed great emphasis upon saving human lives and treating the less fortunate in society with respect" (Courtney, 2014).

The foundation of Baghdad by al-Mansur [المنصور], the second Abbasid ruler, in 762 AD stands as a significant historical event, epitomizing a deliberate architectural and administrative vision during which Baghdad flourished (Wiet, 1971). Al-Mansur's personal experience with illness underscores the importance placed on medical expertise. Al-Mansur requested that a physician from the Persian Academy of Gundeshapur treat him. The academy sent Jurjis Bakhtishu [بن جرجيس بختيشوع] the Nestorian (died 769 AD), who not only treated him, but also stayed in Baghdad, he and his descendants, to serve as private physicians to the dynasty. During his stay in Baghdad the famous physician was asked to translate medical books from Persian. His son Bakhtishu II [الثاني بختيشوع] and grandson Jibril [جبريل] carried on the task following his death, and one of his students Issa bin Shahla [عيسى بن شهلا]contributed to this effort. They all translated books, treated patients and taught

medicine in hospitals established (770-1058 AD). The enduring legacy of Jurjis Bakhtishu and his descendants, who served as court physicians and educators in Baghdad, underscores the pivotal role of Persian medical traditions in shaping Abbasid healthcare infrastructure (Wiet, 1971).

Among the notable physicians of this era, Yuhanna ibn Masawaih [ماسويه بن يوحنا], or Mesue the Elder, (circa 777–857 AD), an Assyrian Nestorian Christian who emerged as a prominent figure. Hailing from the Academy of Gundeshapur, his multifaceted contributions to medicine, encompassing fields such as ophthalmology, febrile disorders, leprosy, and melancholia underscore his enduring legacy as a scholar, practitioner, and educator. According to the famous book "*The Qanun of Medicine* القانون في الطب" by Ibn Sina [Avicenna ابن سينا] and "*Uyun al-Anba* عيون الانباء" by the famous medieval Arabic historian Ibn Abi Usaybia [اصيبعة ابي ابن], Yuhanna Ibn Masawaih came to Baghdad and studied under the physician Jibril Ibn Bakhtishu (Ibn Abi Usaybia, 1996; Ibn Sina, 2005). He published in both the Arabic and Syriac languages in many medical fields, including *Kihala* [eye diseases كحالة], *Homma* [fevers حمّى], *Baras* [leprosy برص], *Jonoon* [melancholia جنون]. Vadet says, "He (Ibn Masawaih) regularly held an assembly of some sort, where he consulted with patients and discussed subjects with pupils and he (engaged in) the testing of physicians" (Vadet, 1960). He became director of a hospital in Baghdad. Similarly, Thabit Ibn Qurra al-Harrani (826-901)[ثابت بن قرة الحراني] and his descendants left an indelible mark on Arabian medicine, embodying the spirit of innovation and scholarly pursuit that characterized Abbasid medical advancements (Ibn Qurra, 1928).

THE MEDICAL ENVIRONMENT

Arabic medicine is usually defined as all aspects of medical sciences written and/or published in the Arabic language during the period (700-1300 AD), which is mostly the Abbasid era, by anyone living in the Islamic countries regardless of his/her ethnic origin, religious affiliation, place of birth or mother tongue. Great institutions of learning abounded, libraries were plentiful and well supplied with books and manuscripts. The Caliphs made sure of being close to eminent scientists and rewarded them well. Many hospitals were established, attracting aspiring students eager to glean wisdom from luminaries such as Ibn Sina and al-Razi [Al Razes الرازي] (Albinali, 2013).

The evolution of medicine under the Abbasid dynasty unfolded in three distinct phases, each building upon the foundations laid by its predecessor. Initially, the translation of knowledge from diverse cultural sources laid the groundwork for subsequent advancements. As a critical mass of translated works became available, the second phase commenced, characterized by original writings and the discovery of novel methods and techniques. Essential to this progression was the third phase of establishing medical institutions dedicated to both treatment and pedagogy (Ayad, 2015)

In the aftermath of Baghdad's construction, successive Caliphs and influential figures augmented the city's intellectual landscape by founding institutions of higher learning, each endeavouring to surpass the achievements of his predecessors. Foremost among these establishments was the renowned "House of Wisdom بيت الحكمة", a hub of translation tasked with rendering works from Indian, Greek, Syriac and other cultures into Arabic for the benefit of scholars converging in Baghdad.

Mackensen underscores the proliferation

of knowledge repositories in Baghdad during this epoch, noting the establishment of four notable libraries. Among these, the earliest, commissioned by al-Mamun [المأمون] during his caliphate from 813 to 833 AD, stood as a testament to the Caliphal commitment to scholarly pursuits. Similarly, Sabur Ibn Ardashir's [أردشير بن سابور] library, established circa 991 or 993 AD, catered to the intellectual needs of scholars frequenting his academy, further enriching Baghdad's intellectual milieu (Mackensen, 1932).

Concepts Governing Medical Care

The principles governing medical care in Islamic societies are deeply rooted in Sharia law, which mandates the protection of human life. Consequently, Muslim scholars traditionally categorised sciences into two domains: those pertaining to the spiritual realm and those concerning the physical body. A common assertion posits that Muslim physicians lacked detailed knowledge of the body's internal organs due to religious prohibitions against what is deemed corpse desecration, although there is no explicit or direct prohibition of dissection found in the Qur'an or Sunna. While the prevailing belief suggests reluctance among Muslims to perform dissections, historical evidence challenges this notion. Yuhanna Ibn Masawaih stands as a notable exception, as documented instances reveal his engagement in anatomical studies. Faced with challenges in procuring human cadavers, Ibn Masawaih resorted to dissecting apes in a designated facility. Particularly noteworthy is his dissection of a specific species of ape, chosen for its anatomical resemblance to humans. Notably, in 836 AD, Caliph al-Mu'tasim [بالله المعتصم] facilitated Ibn Masawaih's access to these specimens through diplomatic channels, arranging for their procurement from the ruler of Nubia [النوبة] (Browne, 1921). This exceptional case sheds light on the complexities surrounding anatomical studies in the Islamic world and underscores the nuanced approach adopted by certain scholars in pursuit of medical knowledge.

Principles of Health care

In the perspectives of renowned scholars such as al-Razi and Ibn Sina, medicine is encapsulated as an art comprising three fundamental aspects. Firstly, it entails the proactive endeavour of preserving good health. Secondly, it involves the strategic combat against diseases afflicting the body, and thirdly, it encompasses the intricate process of restoring health to those afflicted by illness. This comprehensive definition delineates the multifaceted nature of medicine, emphasizing its pivotal role in safeguarding individual well-being and ameliorating human suffering (Mackensen, 1932).

In his seminal work "*Al-Morshid* [The Guide المرشد]*: An Introduction to the Profession of Medicine*," al-Razi delineates the foundational principles underpinning healthcare as he perceives it. Central to his approach is the systematic elucidation of disease, beginning with a meticulous definition derived from symptomatic manifestations and clinical examination. Subsequently, the physician is tasked with unraveling the underlying etiology peculiar to each malady, a process necessitating a discerning analysis of causative factors and symptomatic presentations. Discriminating between singular diseases or a confluence of multiple pathologies becomes imperative, facilitating precise diagnostic categorisation (Al-Razi, 1995).

Integral to al-Razi's therapeutic philosophy is the prescription of interventions tailored to the specific needs of each patient, whether through dietary

modifications, pharmacological agents, or a judicious combination thereof. Fostering a relationship built on trust and mutual understanding, the physician endeavours to engender the patient's confidence and compliance with therapeutic recommendations. Echoing the precepts of the Hippocratic Prognostics, the physician assumes the role of a prognosticator, adeptly forecasting the trajectory of illness and preemptively apprising the patient of potential outcomes (Al-Razi, 1995).

Al-Razi further imparts pragmatic counsel to both physician and patient. The first advocates for a conservative therapeutic approach, “if the physician was able to treat with foods without drugs, then all will be happy”. The second underscores the importance of patient allegiance to a singular trusted physician, cautioning against the fragmentation of care-seeking behaviour across multiple practitioners, “the patient must seek treatment at one trusted physician, for his wrong will be small compared to his right. But who seeks care at many, he is almost to fall into every one’s wrong” (Al-Razi, 1995). Embracing these principles, al-Razi elucidates a holistic framework for healthcare delivery characterised by diagnostic precision, therapeutic prudence, and patient-centerdness.

THE GREAT MENTORS

It is imperative to acknowledge the significant contributions of several eminent physicians who flourished during the Abbasid era. Among these luminaries stands Ali Ibn Rabban al-Tabari [الطبري ربن بن علي], commonly known as Ibn Rabban, whose scholarly pursuits left an indelible mark on medical literature. Mohammad Ibn Zakariya al-Razi [الرازي زكريا بن محمد], revered for his pioneering advancements in various medical disciplines, emerges as a towering figure in the annals of medical history. Similarly, the legacy of Ali Ibn al-Abbas al-Majusi [بن علي المجوسي العباس], also known as Haly Abbas, endures through his seminal contributions to medical scholarship. Al-Hussein Ibn Sina [سينا ابن الحسين], widely recognized by his Latinized name Avicenna [سينا ابن], distinguished himself as a polymath whose medical treatises continue to inform modern medical practice. Collectively, these luminaries exemplify the scholarly vigor and profound impact of Abbasid-era physicians on the advancement of medical science (Al-Qifti, 1903; Brater & Daly, 2000; Browne, 1921; Hunke, 2009; Neuburger, 1910; Tschanz, 2003).

Ali Ibn Rabban al-Tabari الطبري ربن بن علي

Ali Ibn Rabban al-Tabari, born in Merv [مرو] (modern-day Mary-vilayat Turkmenistan تركمانستان ماري ولاية) circa 810 AD, derived his name "al-Tabari" from his upbringing in Tabaristan [طبرستان]. Commissioned by Caliph al-Motawakkil [المتوكل الخليفة] around 850 AD, he embarked on the monumental task of composing "*Firdaws al Hikma*" **[**The Paradise of Wisdom فردوس الحكمة**]**. This comprehensive work encompassed not only medicine but also delved into various disciplines such as philosophy, zoology, embryology, psychology, and astronomy (Browne, 1921).

Al-Tabari characterized his magnum opus as a compendium that encapsulated a substantial portion of the knowledge requisite for a young medical graduate. He says about his book, “but he who masters this book, and fully fathoms and perpends it, will find in it the greater part of what the young graduate needs of the Science of Medicine and the action of the natural forces in this Microcosm and also in the Macrocosm” (Browne, 1921). Notably, the term "graduate" denotes an

individual who has completed formal studies. It is pertinent to highlight that although a formal qualifying examination in medicine may not have been established at the time of al-Tabari's writing in 850 AD, such measures were implemented eighty years later during the reign of Caliph al-Muqtadir [المقتدر الخليفة] on account of a case of malpraxis which came to his notice in 931 (Browne, 1921). Under the caliph's decree, as al-Qifti [القفطي] informs us (Al-Qifti, 1903), individuals aspiring to practice medicine in Baghdad were required to demonstrate their competency and proficiency to Sinan Ibn Thabit of Harran [ثابت بن سنان]. This mandate subjected approximately 860 aspiring physicians to rigorous scrutiny, with the exception of a few physicians of recognized standing, who, on account of their reputation, were exempted from this test (Browne, 1921).

Significantly, al-Tabari's scholarly influence extended beyond his written works, as he assumed the role of mentor to the illustrious al-Razi. This symbiotic teacher-student relationship exemplifies the inter-generational transmission of knowledge and underscores al-Tabari's enduring legacy as a preeminent figure in Abbasid-era medicine.

Mohammad Ibn Zakariya al-Razi محمد بن زكريا الرازي

Mohammad Ibn Zakariya al-Razi, known as Rhazes in Latin, (854-925 AD), is hailed by Sigrid Hunke as one of the greatest physicians in all human history (Hunke, 2009). His seminal work, "*Al Hawi fil Tibb* الحاوي في الطب" or "*Continens Liber*" in Europe, is a testament to his enduring legacy. Edward Granville Brown lauds al-Razi as "probably the greatest and most original of all physicians, and one of the most prolific as an author" (Browne, 1921).

Al-Razi's pedagogical approach, characterized by hands-on clinical instruction, epitomizes his commitment to medical education. Within the confines of the hospital, he presided over a cadre of students and disciples, facilitating a hierarchical system where cases were meticulously examined by successive tiers of learners. Patients were first evaluated by clinical clerks, followed by the master's immediate pupils, and ultimately, if necessary, by al-Razi himself (Browne, 1921). This pedagogical model not only fostered experiential learning but also ensured the dissemination of medical knowledge across generations.

Al-Razi's association with the Buwaid [البويهي] ruler Adud al-Dawla [الدولة عضد], who reigned from 949 to 982 AD, is notable, particularly in the establishment of the Bimaristan Adudi (Adudi Hospital البيمارستان العضدي) the site of which al-Razi is said to have selected, and later on, he became chief physician within its halls. His prodigious literary output comprises 113 major and twenty-eight minor works, spanning diverse medical topics.

Of particular significance is al-Razi's treatise on smallpox and measles, titled "*de Peste* والجدري الحصبة في كتاب", which was translated and published in Latin in 1565 AD in Venice. Regarded as a seminal work in the field of epidemiology, Neuburger says “on every hand and with justice it is regarded as an ornament to the medical literature of the Arabs.” Then he continues, “It ranks high in importance in the history of epidemiology as the earliest monograph upon smallpox” (Neuburger, 1910).

Among al-Razi's illustrious oeuvre, "*Al-Mansuri* المنصوري" or "*Liber Almansoris*" and "*al-Hawi fi al-Tibb* الحاوي في الطب" or "*Liber Continens*" are renowned for their scholarly rigor and enduring relevance (Ibn Al-Nadim, 1930). Translated into Latin in

1489 AD and 1486 AD respectively, these works garnered widespread acclaim and solidified al-Razi's reputation as a luminary in the medical field.

Ali Ibn al-Abbas al-Majusi علي بن العباس المجوسي

Ali Ibn al-Abbas al-Majusi, known as Haly Abbas (died 1010 AD), occupies a distinguished place in the annals of medical history. His seminal work, "*Kamel al-Senaa'a al-Tibbiyyah* الطبية كامل الصناعة", also known as "*al-Malaki* الملكي" or "*Liber Regius*" in Latin, stands as a testament to his scholarly acumen and enduring influence. Esteemed by students for its practicality, "*al-Malaki*" remained a cornerstone of medical education until the advent of Ibn Sina's "*al-Qanun*", which supplanted it with a more theoretical approach (Al-Qifti, 1903).

Comprising twenty discourses, "*al-Malaki*" is structured into ten treatises on theory and ten on practice. Notably, the second and third discourses are dedicated to anatomy, with French translations of these sections published by Dr. P. de Koning in "*Trois Traites d'Anatomie Arabes* ثلاث رسائل في التشريح عند العرب" (pp. 90-431 Leyden, 1903). The 19th discourse with 110 chapters is devoted to surgery (Browne, 1921).

Al-Majusi's pedagogical philosophy, articulated within his magnum opus, emphasizes the paramount importance of clinical exposure and experiential learning. He advocates for the diligent attendance of hospitals and sick-houses, urging students to closely observe the conditions of patients under the tutelage of seasoned medical practitioners. By immersing themselves in the clinical milieu and diligently interrogating the manifestations of disease, aspiring physicians are encouraged to synthesize theoretical knowledge with practical experience, thereby attaining proficiency in the healing arts (Browne, 1921).

Al-Majusi's enduring legacy lies not only in his comprehensive treatise but also in his pedagogical insights, which continue to resonate in medical education today.

Al-Hussein Ibn Sina or Avicenna الحسين بن سينا

Al-Hussein Ibn Sina, commonly known as Avicenna, lived from 980 to 1037 AD, earning epithets such as "al-Sheikh al Rae'es" [Chief Master الشيخ الرئيس] and "al-Muallim al Thani" [Second Teacher المعلم الثاني] after Aristotle [ارسطو], in recognition of his towering intellectual stature. Avicenna represents the culmination of Arabian science, embodying the multifaceted roles of philosopher, physician, and poet (Browne, 1921).

His extensive literary oeuvre, cataloged by Brockelman in "*Geschichte der Arabischen Litteratur* تاريخ الأدب العربي", comprises sixty-eight books on theology and metaphysics, eleven on astronomy and natural philosophy, sixteen on medicine, and four in verse, ninety-nine books in all (Browne, 1921).

Of prominence is his magnum opus, "*al-Qanun fi al-Tibb* القانون في الطب" or "*Canon Medicinae*" in Latin, which stands as the largest, most renowned, and pivotal work in Avicenna's medical corpus. It is also the most accessible, both in the original Arabic and in the Latin translation of Gerard of Cremona. There is a modern Egyptian edition of the Arabic text (Ibn Sina, 2005). Esteemed for its encyclopedic scope, systematic organization, and philosophical underpinnings, the "*Qanun*" holds a preeminent position within the Muslim world's medical literature, eclipsing earlier works by luminaries such as al-Razi and al-Majusi.

Edward G. Browne in his famous lecture to the Royal Society of Medicine in 1921 AD

says about the book, “Its encyclopedic character, its systematic arrangement, its philosophic plan, perhaps even its dogmatism, raised it to a unique position in the medical literature of the Muslim world, so that the earlier works of al-Razi and al-Majusi, in spite of their undoubted merits, were practically abrogated by it” (Browne, 1921).

Avicenna's enduring legacy extends beyond his seminal treatise, as evidenced by his contributions to the methodology of clinical drug trials. He delineated seven rules for testing the efficacy of new medications, laying the groundwork for modern clinical drug trials.

These principles still form the basis of modern clinical drug trials (Tschanz, 2003; Brater & Daly, 2000). The drug must be free from any extraneous accidental quality, it must be used on a simple, not a composite disease, it must be tested with two contrary types of disease, because sometimes a drug cures one disease by its essential qualities and another by its accidental ones, also the quality of the drug must correspond to the strength of the disease, and its time of action must be observed. The effect of the drug must be seen to occur constantly or in many cases, for if this did not happen, it was accidental. In all cases the experimentation must be done with the human body, for testing a drug on a lion or horse might not prove anything about its effect on man.

THE HOSPITALS

The term "Bimaristan بيمارستان", derived from Persian, denotes a hospital, with "bimar" signifying sick and "stan" serving as a suffix indicating location. Within the medieval Islamic world, Bimaristans emerged as vital institutions devoted to the compassionate care and treatment of the ailing populace under the supervision of qualified medical personnel (Nagamia, 2003).

Originally serving as comprehensive medical facilities, Bimaristans provided care for a wide spectrum of ailments encompassing medical, surgical, ophthalmic, and psychiatric conditions. However, over time, many Bimaristans fell into disrepair due to calamities and a lack of sustained support, leading to their abandonment by all but the mentally ill, who found themselves with no alternative refuge. Notably, the term "maristan" still connotes a hospital, though in certain Arab nations, it has come to denote facilities specifically catering to the mentally ill (Al-Jawhari, 1987).

Various types of Bimaristans existed, predominantly categorized as either general or mobile. General Bimaristans, such as the esteemed Bimaristan al-Adudi [بيمارستان العضدي], constructed under the patronage of Adud al-Dawla in 928 AD and razed by the Mongols in 1256 AD, served as fixed structures catering to diverse medical needs. Some enduring examples include Bimaristan al-Mansuri [المنصوري بيمارستان] in Cairo, Bimaristan al-Nouri [النوري بيمارستان] in Damascus, and Bimaristan Argun al-Kamili [الكاملي آرغون بيمارستان] in Aleppo (Issa, 2011). Conversely, mobile Bimaristans were deployed in response to disease outbreaks or wartime exigencies, exemplifying adaptability in healthcare delivery.

During the reign of al-Muqtadir Billah [بالله المقتدر], the minister Ali Ibn Issa [علي بن عيسى]dispatched orders to Sinan Ibn Thabit, director of Bimaristans, to deploy mobile hospitals to inspect the health status of prisoners in all prisons. This initiative also entailed providing inmates with essential provisions such as food, clothing, and medications (Al-Qifti, 1903; Ibn Abi Usaybia, 1996).

One notable instance of a mobile hospital was orchestrated under Sultan Mahmoud al-Saljuki [السلجوقي محمد سلطان], overseen by the physician Aba al-Hakam al-Maghrabi [أبا المغربي الحكم] and transported via forty camels (Al-Qifti, 1903; Ibn Khallikan, 2009). Bimaristans were meticulously segregated into distinct male and female quarters, each equipped with specialized facilities for internal medicine, surgery, *kihala* [ophthalmology كحالة], and a hall for *tajbeer* [setting fractures تجبير] (Ibn Abi Usaybia, 1996). The internal medicine hall had sections for those with fevers, those with diarrhea and those with mental illness (Ibn Abi Usaybia, 1996).

Furthermore, outpatient services were provided where the patient is seen in a room, the doctor sitting on a high stool prescribes a medication on paper, which the patient collects from the pharmacy to take at home, or the patient was admitted to the relevant inpatient sections. Each section had two or three doctors depending on the hour and number of patients (Ibn Abi Usaybia, 1996). Consultations were allowed when a doctor is called from one section to the other if needed (Ibn Abi Usaybia, 1996). On call duties were arranged; Jibril Ibn Bakhtishu was on call two days and two nights every week (Al-Qifti, 1903).

Administratively, Bimaristans were overseen by a hierarchy of leadership. The bimaristan had a the *Saour* [chief] and three clinical heads: a chief of medicine who gives permission for doctors to practice and manage patients, a chief of *kihala* [ophthalmology كحالة] with same power over *al-kahhaloon* [ophthalmologists الكحّالون] and a chief of surgery for surgeons and *mojabberoon* [bone setters المجبرون] (Al-Qalqashandi, 1913; Ibn Abi Usaybia, 1996). It also had ancillary staff like porters, servants, cooks, and maids. The *Sharabkhana* [pharmacy شرابخانة], was under the purview of a chief pharmacist (Ibn Abi Usaybia, 1996) and stocked a comprehensive array of medications and utensils made of porcelain, and it stocked very expensive herbs and potions (Al-Qalqashandi, 1913). The pharmacy of the bimaristan al-Mansuri had an endowment to keep it. Each pharmacy had a *mohtar* [مختار], which is Persian for chief; he had subordinates called *sharabdars* [سُقاة]. The administrator of the bimaristan was a high-ranking state post appointed only by the ruler and had great privileges (Al-Qalqashandi, 1913). Physicians occupying pivotal roles within bimaristans were duly compensated for their expertise and services, with generous remuneration reflecting the esteemed status accorded to their profession. Jibril Ibn Bakhtishu, for instance, received substantial compensation for his dual roles, receiving 300 *Dirhams* for being physician to the caliph and 300 *Dirhams* for being chief of bimaristan (60 gold Dinars in total per month). An Abbasid *Dinar* weighed 4.25 gm of pure gold. (eight ounces of twenty carat gold at 1500 Sterling per ounce is worth 12,000 pounds per month nowadays) (Ibn Abi Usaybia, 1996).

MEDICAL TRAINING AND LICENSING

Medical education and licensing procedures during the Abbasid era were characterized by structured curricula and rigorous standards, reflecting a commitment to advancing medical knowledge and ensuring the competence of practitioners. Hamarneh and Ajlouni have noted that educational programs of the time closely resembled modern medical curricula, encompassing a diverse array of subjects including anatomy, physiology, pathology,

pharmacology, preventive medicine, hygiene, and clinical practice (Hamarneh & Anees, 1983; Ajlouni, 2003).

Training took place within specialized areas adjacent to hospitals or directly within hospital premises, where both inpatient and outpatient facilities were available. These facilities included examination halls for student training and seminars, akin to contemporary educational settings. Notably, hospitals were equipped with specialized libraries renowned for their comprehensive collections, offering students access to a wealth of medical knowledge. Free papers and ink for copying were provided. Junior students and physicians were typically apprenticed to the 'Hakim حكيم', or chief physician, facilitating hands-on learning and mentorship (Hamarneh & Anees, 1983).

Descriptions by Ibn al-Nadim [النديم ابن] offer insight into teaching methodologies employed during this period. Ibn al-Nadim in "*al-Fihrist* الفهرست" described how al-Razi managed his teaching sessions, "Razi sat on his chair, below him were his students, and below them their students, so if the patients arrives he meets a student from the first row, he describes what his ailment, so if the student has "knowledge" he spoke, otherwise he was passed to the second row, if he was not correct, then al-Razi would speak" (Ibn Al-Nadim, 1930).

According to Ibn al-Nadim, teaching was done by the teacher standing by the patient's bed and his students around him in rows according to seniority. The teacher starts by asking the patients about his name, work and his abode. Then he asks him about his complaint and its duration, while he is checking his pulse and touching his skin, checking the color of his eyes and features. He also examines his urine, saliva and stools. So, if his questioning to the patient finished, he leaves the matter to his students to voice their opinions regarding diagnosis and treatment, discussing and guiding the process (Ibn Al-Nadim, 1930). Teaching was in its purist form; the role of the teacher was to guide and provoke thinking.

The Caliphs al-Mamun (813-833 AD) [المأمون الخليفة] and al-Mu'tasim (833-842 AD) [المعتصم الخليفة], paved the way for the first state enforcement of Ethical standards and professional regulations governing medical practice (Hamarneh & Anees, 1983). In 931 AD, following a fatal medical error, Caliph al-Muqtadir [المقتدر الخليفة] initiated mandatory examinations conducted by the chief physician, Sinan Ibn Thabit, to assess the competency of aspiring physicians before granting them permission to practice. Notable texts such as "*Mehnat al Atibba'a* محنة الأطباء" by Galen and "*Mehnat al Tabib* محنة الطبيب" by al-Razi and by Ibn Masawaih provided guidance on examination procedures and medical ethics required for graduation (Hamarneh *and* Anees, 1983). As for *kihala* [ophthalmology], a third book was added; "*The Ten Treatises on Ophthalmology* العين في مقالات العشر" by Hunayn Ibn Ishaq [اسحق بن حُنين] (Al-Shaizari, 1946; Issa, 2011).

It should be noted that *imtihan* (Arabic for Examination امتحان) and *mehnat* (Arabic for tribulation محنة) come from the same language root in Arabic to indicate the seriousness of passing a test. Other forms of assessment depended on writing a thesis, be it the graduate's own opinion and discovery, or an analysis of some treatise written by somebody else, but he took it for further discussion and critique (Al-Shaizari, 1946; Issa, 2011). Those who passed the exam (qualified), where awarded a license issued in their names with Sinan Ibn Thabit's signature affixed on it (Hamarneh & Anees, 1983). Subsequently, all graduating physicians were

administered the Hippocratic Oath [ابقراط قَسَم] by al-Mohtaseb [المحتسب], who oversaw continuous quality control and addressed complaints of negligence, akin to modern-day medical regulatory bodies (Hamarneh & Anees, 1983). Physicians were expected to adhere to strict protocols during patient consultations and treatment. The practicing physician was governed by a set of rules he must abide by; otherwise, he is subjected to *hisbah* [questioning حسبه]. Quoting al-Shaizari's [الشيزري] "*the hisba" (Al-Shaizari, 1946)*, Hamarneh (Hamarneh & Anees, 1983) in his monograph writes,

so, when the physician visits a patient (in the hospital), he must enquire from him about the causes of his disease (history), and the pain he feels (complaint), and know the cause, the sign, the pulse, the urine, and the drugs (examination). He should write down a prescription for him that includes drinks and other things." Once the physician finished his examination and formulated his opinion and reached what he thinks is the correct diagnosis then he has to write down what the patient (had) told him and of the prescription he has prepared to cope with the disease, (and) make a copy of what he has written and hand it to the patient's household. The physician must visit the patient daily in a manner to what we call today clinical rounds usually with his students, each visit writing the finding of the patient's condition on that particular day.

Hamarneh (Hamarneh & Anees, 1983) also quotes, he (the physician) is to repeat that (clinical notes) on the third and fourth day, and so on, until the patient either recovers or dies. If he recovers, the doctor will get his fee and bonus. But if the patient dies; his next of kin will go to the *Hakim* (chief of physicians) and show him the copies written down by the doctor. If this chief physician finds them complying with the requirements of medical craft and rules, without any negligence and carelessness on the doctor's part, he will tell them that. But if he finds otherwise, he will tell the deceased patient's relatives: "You should claim damages for the death of your relative from the doctor who killed him out of malpractice and heedlessness."

Regrettably, the illustrious legacy of Abbasid-era hospitals was marred by the devastating Siege of Baghdad in 1258 AD, led by the Mongol Empire armies. Nothing remained of the hospitals or of Baghdad for that matter. However, despite the destruction wrought by the siege, vestiges of Abbasid-era hospitals endure to this day. Notable examples include the al-Mansuri [المنصوري] or Qalwoon [قلاوون] hospital in Cairo and two in Syria. The largest is the al-Nouri hospital [النوري] in Damascus with its unique architecture (Allen, 1986), which has been restored and now serves as the Museum of Medicine and Science in the Arab World, a testament to the enduring legacy of medieval Islamic medicine.

In conclusion, the establishment and evolution of medicine during the Abbasid era, exemplify a remarkable period of advancement and innovation in healthcare. From the visionary infrastructure projects initiated by al-Mansur to the establishment of prestigious medical institutions like the House of Wisdom [الحكمة بيت] and al-Adudi hospital [العضدي البيمارستان], the Abbasid dynasty fostered an environment conducive to the pursuit of medical knowledge and practice.

The rigorous training and licensing processes implemented during the Abbasid era underscored a commitment to professional standards and patient care. Through meticulous observation, diagnosis,

and treatment, physicians like al-Razi and Ibn Sina left an indelible mark on the field of medicine, their works continuing to inspire and inform medical practice today.

Despite the eventual decline and destruction wrought upon Baghdad and its institutions by the Mongol invasion, the legacy of Abbasid medicine endures through surviving hospitals and the dissemination of medical knowledge across cultures and generations. As we reflect on this rich history, we recognize the enduring significance of the Abbasid era in shaping the trajectory of medical science and healthcare delivery.

The medical legacy of the Abbasid era is too expansive to be fully captured within the confines of a single article. Spanning centuries of intellectual growth and cross-cultural exchange, it encompasses a wide array of scholars, texts, institutions, and innovations that collectively shaped the trajectory of medical science. This article offers a selective overview of some of the key aspects of Abbasid medicine—its educational structures, hospital systems, and notable physicians—serving as an entry point into a much broader and deeper historical landscape. It is intended not as a comprehensive account, but as a concise introduction to the remarkable medical advancements achieved under Abbasid golden age.

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تعليم الطب في العصر العباسي: من التوجيه والإرشاد إلى الامتحانات التأهيلية

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الملخص

شهد العصر العباسي نهضة علمية متميزة، كان للطب فيها نصيب بارز؛ إذ سعى الخلفاء العباسيون إلى دعم العلوم والفنون، وتنافسوا في رعاية العلماء وتهيئة البيئة الملائمة لازدهار المعرفة. يهدف هذا البحث إلى استعراض مسيرة التعليم الطبي خلال هذه الحقبة، مبرزًا دور الأطباء الرواد في إنشاء المستشفيات وإدارتها، وتدريب طلاب الطب من خلال أساليب تعليمية متقدمة. يبين البحث بصورة لا تقبل الشك بأن العديد من ركائز التعليم الطبي الحديث—مثل التعليم السريري المباشر، وتدريب الأطباء المقيمين عبر الجولات السريرية والتوثيق الطبي، والاختبارات التأهيلية النهائية، والإشراف المهني المنظم والحصول على موافقة المريض المستنيرة — تعود جذورها إلى الممارسات التي أُرسيت خلال العصر العباسي.

الكلمات الدالة: العباسي، التعليم، الطب، التدريس، المستشفى