

**МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ
Харківський національний медичний університет**

**ГРОМАДСЬКЕ ЗДОРОВ'Я В УКРАЇНІ:
ПРОБЛЕМИ ТА СПОСОБИ
ЇХ ВИРІШЕННЯ**

Томілінські читання

*Матеріали VIII науково-практичної конференції
з міжнародною участю*

м. Харків, 30 жовтня 2025 року

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FEATURES OF THE ORGANIZATION AND ACHIEVEMENTS OF MILITARY MEDICINE IN THE ARABIC WORLD DURING THE MIDDLE AGES

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During the period known as the European Middle Ages, medical science on the continent was often influenced by outdated dogmas, superstitions, and a mystical perception of diseases. In many cases, treatment was reduced to prayers, exorcism, or crude surgical interventions, as illustrated by anecdotal examples where wounded knights had their limbs amputated with axes, and illnesses were «treated» by cutting crosses into the skull. In stark contrast, this period, from the 8th to the 14th century, became the «Golden Age» of scientific discoveries and rapid medical development in the Arab world, based on empiricism, rationalism, and institutional support.

This publication analyzes the unique features of the organization of Arab military medicine and its key achievements, compared to European practices of the same era. The study's subject included the philosophical foundations, institutional structure, technological innovations, and prominent medical figures who made a significant contribution to the development of global medicine. The comparative analysis demonstrates that Arab military medicine was not merely a collection of knowledge but a highly organized system that significantly surpassed its European counterpart and became a key catalyst for the European medical renaissance, especially during the Crusades. The sources used include scientific articles from journals, monograph reviews, and other academic publications, which provide a solid basis for the stated conclusions.

The development of medicine in the Arab world was not a random coincidence but was driven by deep cultural, religious, and institutional factors that created a uniquely favorable environment for scientific research and practical application of knowledge. This foundation was fundamentally different from what existed in Europe at the time, where medical thought was often constrained by religious dogmas.

Islamic religious texts, particularly the Quran and Hadith, laid the groundwork for a humane and scientific approach to treatment. The central idea was that illness is not a divine punishment but a challenge for which God has provided a cure. The Prophet Muhammad said, «There is no disease that God has created, except that He also created a method for its cure». This statement served as a direct call for scientific inquiry, experimentation, and the advancement of medical knowledge. Unlike the European concept, where disease was often seen as a consequence of sin, in Islamic culture, healing was an act of worship and a moral obligation. This philosophical stance transformed medical practice from a passive care of the soul into an active effort to save life and health. This attitude was particularly important for military medicine, as it prioritized effective intervention and the salvation of warriors, rather than a fatalistic view of their fate.

Arab medicine did not develop in isolation: it was the result of a synergistic fusion of the medical traditions of Greece, Rome, Persia, India, and pre-Islamic Arabia. Arab scholars translated, analyzed, systematized, and expanded upon this knowledge, creating encyclopedic works that later became the basis for medical education in both the East and the West. A vivid example is the work of *Al-Razi*

(Rhazes), who, while respecting the works of *Galen*, critically re-evaluated his ideas when his own observations proved them inaccurate. This indicates that Arab scholars did not blindly follow authority but used an empirical approach that is the foundation of modern science.

The concept of a hakim, or «wise person» was central to this process. Leading Eastern philosophers, such as *Ibn Sina* (Avicenna) and *Ibn Rushd* (Averroes), were also prominent physicians. This integration of knowledge from various fields – from philosophy to natural sciences – allowed for a holistic approach to treatment. This approach sharply contrasted with the European division, where priests handled medical treatment and surgery, considered «unclean», was relegated to barbers. This institutional separation significantly hindered the development of European medicine.

Unlike many regions in Europe where medical practice was unregulated, in the Arab world it was highly professionalized. Physicians were required to pass oral and written examinations to obtain a license. One source reports that in 931 CE in Baghdad, 860 doctors were examined, and only the qualified were allowed to practice.

The profession of a *pharmacist* (saydalanah) was also a distinct field, requiring its own training, licensing, and adherence to standards. Pharmacists controlled the quality of preparations, ensured accurate dosing, and followed storage rules. This level of regulation was a direct consequence of the understanding that effective and safe medical care required not only the competence of doctors but also a clearly defined system of accountability and quality. Although licensing laws later appeared in the Crusader states, this only confirms the direct influence of the Arab model, which Europeans had to quickly adopt.

The organization of military medicine in the Arab world was an embodiment of these philosophical and professional foundations. It was based on a flexible yet robust infrastructure that provided care in both stationary and battlefield settings.

A key element of the healthcare system was the *bimaristan*, the Persian name for «sick refuge». These institutions were the precursors of modern multi-specialty medical centers and differed significantly from European hospices, which were often merely shelters for pilgrims or the sick, offering «rest and care» rather than specialized treatment.

Bimaristans were multifunctional centers that combined several functions, such as treatment and rehabilitation: they treated patients with various diseases and also provided assistance to the wounded and injured, including orthopedic and surgical interventions.

The largest *bimaristans* were attached to medical schools, where teachers trained students, then examined them and issued diplomas.

They functioned as refuges for the elderly and infirm, as well as the first known centers for patients with mental illnesses, where treatment included music, fresh air, and light.

The organizational structure of *bimaristans* was remarkably modern. They were divided into specialized departments, such as surgery, ophthalmology, orthopedics, and internal medicine. The staff had clearly defined responsibilities, including an administrator, a sanitary inspector, accountants, and department heads. They were funded by *charitable endowments* (waqf), which ensured their sustainability and autonomy. Some *bimaristans* were created exclusively for the needs of the army.

The organizational structure and functions of a typical Arab *bimaristan* testifies to a deep understanding that effective medical care depends not only on the skills of an individual doctor but also on a systematic approach. It is interesting that the evolution of European hospices, particularly the Order of the Hospitalers, from simple shelters to medical institutions in the 12th century was a direct result of contact with Muslim models.

In addition to stationary hospitals, Arab armies deployed a system of mobile medical units. The first known aid center was a tent established by *Rufaydah al-Aslamiya* during the «Battle of the Trench» in the time of the Prophet Muhammad. Later, rulers developed these prototypes into genuine «traveling dispensaries» that were fully staffed with doctors, pharmacists, medicines, food, and clothing. In the early 12th century, during the reign of the *Seljuks' Sultan Muhammad Saljuqi*, one such hospital was so large that it required 40 camels for its transport.

This level of logistical support was a direct result of the mobility and tactics of Arab armies, which, unlike the heavy cavalry of the Crusaders, relied on speed and maneuverability. The presence of mobile field hospitals allowed for the provision of medical care directly in the conflict zone, which is crucial for increasing the survival rate of the wounded. Thanks to this mobility and systematic approach, Arab military medicine was able to adapt to the dynamics of combat. This concept is the historical precursor to modern Mobile Army Surgical Hospitals (MASH units), emphasizing the continuity of knowledge and practices.

The key achievements of Arab medicine at that time were related to its practical orientation, which was especially evident in the fields of surgery and pharmacology. These innovations not only improved treatment outcomes but also laid the foundation for the further development of medicine in Europe.

Abu al-Qasim al-Zahrawi (Abulcasis) (c. 936–1013), known in the West as the «father of operative surgery», was one of the most influential figures. In his encyclopedic work *Al-Tasrif*, he described over 200 surgical instruments, many of which he designed himself. His book contained detailed illustrations intended for teaching students and explaining the manufacturing of instruments, which was unprecedented at the time.

Al-Zahrawi was the first to describe in detail the ligation of blood vessels to stop bleeding, a technique developed five centuries before the French surgeon *Ambroise Paré* (1510–1590) rediscovered it. He also developed a method for repositioning a dislocated shoulder, which became known in the West only centuries later thanks to the Swiss surgeon *Emil Theodor Kocher* (1841–1917). His work also highlighted other procedures directly relevant to military medicine, such as the treatment of anal fistulas, and the setting of dislocated bones and fractures. *Al-Zahrawi* emphasized the importance of studying anatomy, stressing that without this knowledge, a surgeon could cause more harm than good. His work, *Al-Tasrif*, became a standard textbook on surgery at the Salerno medical school, providing undeniable proof of the direct transfer of knowledge and its recognition by European medical professionals.

The systematic use of anesthesia is one of the most significant achievements of Arab medicine. Arab physicians, including *Abulcasis*, used «anesthetic sponges» soaked in a solution of narcotic substances, which were given to patients to inhale before surgery. These mixtures included opium, mandrake, henbane, Indian hemp, and other plants. These medicines could also be administered in other ways, for example, through suppositories. In military settings, where injuries were extremely painful, the ability to provide anesthesia was a significant advantage, allowing for more complex operations and alleviating suffering.

The systematization of knowledge in pharmacology and the designation of pharmacy as a separate licensed profession ensured the quality and accuracy of the preparation of these complex mixtures.

Hygiene in the Arab world was not just a cultural feature but a strategic advantage that had direct consequences for army survival. Arab sources noted the striking disregard of the Crusaders for personal hygiene, pointing out that their knights

«boasted» of washing no more than four times a year. This approach contrasted with Arab practices of ritual ablution before five daily prayers and contributed to the development of complex systems of public water supply and baths.

In medical practice, Arabs used antiseptics such as alcohol, vinegar, and rose water to clean wounds. This was the complete opposite of practices in European armies, where sanitation was virtually nonexistent. Survival in medieval armies depended not so much on combat injuries as on diseases and infections. Therefore, the Arab focus on cleanliness and sanitation was a key factor in maintaining troop combat readiness by reducing losses from epidemics and postoperative complications.

The conflict of the Crusades became a unique catalyst for cultural and medical exchange. It revealed the fundamental differences between the two medical systems and confirmed that the Arab model was significantly more advanced.

Comparing the philosophies of Arab and European medicine, one can conclude that they were in conflict. European medicine of that period often viewed illness as divine punishment. Moreover, at the Council of Tours in 1163, it was proclaimed that «the Church abhors bloodshed» (*Ecclesia abhorret a sanguine*), which limited surgical practice for the clergy who served as doctors. This created an institutional gap between medical theory, which remained with the clerics, and practical surgery, which was handed over to barbers. This division significantly hindered the integrative development of medical thought. In contrast, Arab medicine, based on rationalism and empiricism, promoted the development of both theoretical knowledge and practical skills, personified by the figure of the *hakim* (from Arabic, «doctor, healer, sage, philosopher»).

The Crusades, while a military conflict, became a paradoxical channel for the transfer of medical knowledge from East to West. European medics who encountered the practices of Arab doctors became convinced of their effectiveness. This led to the mass translation of Arabic medical texts into Latin, especially in centers such as Antioch and Spain. The works of *Al-Razi* and *Ibn Sina*, particularly *The Canon of Medicine*, became standard textbooks in European universities and remained so for centuries. This process was not one-sided. Although Europeans borrowed knowledge, this also shows that the Crusader states were not a «cultural void» but dynamic centers where significant intercultural exchange took place, driven by urgent needs.

The difference between Arab *bimaristans* and European *hospices* was colossal. European «*hospitals*» of the time were primarily shelters that provided minimal care under the guidance of monks who sought the «salvation of the patients' souls». In contrast, Arab *bimaristans* were multi-specialty medical centers with departments, qualified staff, and strict administration.

The only significant exception was the Order of the Hospitallers, whose organization and medical practices had a «close connection» with Muslim hospitals. The Hospital of the Order of Saint John in Jerusalem, which could accommodate up to two thousand patients, evolved from a European shelter into a medical institution in the 12th century, a direct result of contact with Muslim and Byzantine models. This difference in hospital care models directly affected the survival of the wounded and sick and is a clear testament to the superiority of the Arab system.

Conclusion. An analysis of scientific sources leads to the conclusion that military medicine in the Arab world during the Middle Ages was far more advanced and systematic than its European counterpart. This superiority was due to several key factors, such as: *philosophical foundation*, unlike the European fatalistic and mystical medical philosophy, Arab medicine was based on religious imperatives to seek treatment, which promoted a rational and empirical approach; *institutional*

organization: Arab medicine had a clear hierarchy and professional regulation. Specialized bimaristans and mobile field hospitals constituted an infrastructure that significantly surpassed European shelters; and *technological innovations*: the development of surgical instruments (over 200 instruments by *Abulcasis*), techniques (vascular ligation), and pharmacology (anesthetic sponges, whose quality was guaranteed by licensed pharmacists) were unprecedented for their time.

This systemic advantage did not merely coexist with European practices but became a driving force for their development. Contact with Arab medicine during the Crusades and the translation of their works into Latin became the basis for medical education in Europe for centuries. The achievements of Arab doctors, from a systematic approach to licensing to mobile field hospitals, laid the foundations for modern medical practice.

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