



MEDICAL DEVELOPMENT IN WORLD COUNTRIES DURING THE MIDDLE AGES

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ANNOTATION: This article examines the major stages of the development of world medicine in the Middle Ages, particularly the rise of medical science in European countries and its connection with Eastern—especially Asian—medical traditions. It highlights how medicine in the 14th–15th centuries in Europe developed under the influence of economic, social, and cultural factors, emphasizing the discoveries of scholars such as Andreas Vesalius, Leonardo da Vinci, William Harvey, and Girolamo Fracastoro in anatomy, physiology, and infectious diseases. The article also discusses the flourishing of medicine in the Samarkand and Herat centers during the era of Amir Temur, the traditions based on the works of Ibn Sina, and the contributions of Eastern scholars such as Burhoniddin Nafis, Mahmud ibn Umar Chag‘miniy, and others. The formation and development of physiology and anatomy as independent sciences are analyzed through examples such as Vesalius’ “De Humani Corporis Fabrica” and Harvey’s theory of blood circulation. The article demonstrates the mutual influence of Eastern and Western medicine and reveals the nature of medical development in the Middle Ages.

Keywords: European and Eastern medicine, Andreas Vesalius, William Harvey, Leonardo da Vinci, Ibn Sina, Anatomy, Physiology, Blood circulation, Infectious diseases, Samarkand medical center, De Humani Corporis Fabrica.

INTRODUCTION:

The late Middle Ages — the 14th–15th centuries — were not only a time of political and economic transformation in European history but also a period marked by significant developments in science, including medicine. Although many aspects of medical history remain insufficiently studied, this period is notable because it fundamentally changed humanity’s understanding of diseases and treatment methods. Despite the limitations caused by the feudal social structure, religious doctrines, and scarcity of scientific sources, by the 15th century scientific thought and experimental approaches began to take shape.

Although medieval medicine was heavily influenced by religious and mystical beliefs, in the later centuries the ancient heritage of Greek and Roman medical schools began to be revived. The works of Eastern scholars such as Ibn Sina, Abu Ali al-Husayn, and others were translated into Latin and incorporated into the curricula of European universities. This process strengthened the theoretical foundations of medieval medicine and increased the role of scientific approaches in understanding and treating diseases. The social status of physicians increased, and the number of hospitals grew.

Another important aspect of the development of medicine in the late Middle Ages was the expansion of practical, experience-based treatment methods. Anatomical studies deepened the understanding of the human body, and pharmacology developed through experiments involving



medicinal plants and chemical substances. As a result, late medieval medicine adopted a systematic approach aimed not only at treating diseases but also at preventing them.

MEDICINE IN EUROPEAN COUNTRIES DURING THE MIDDLE AGES:

While medieval medicine reached an advanced stage in Eastern countries, conditions in Europe differed significantly. During the early Middle Ages, Europe experienced stagnation in science and culture, and superstition, magic, and shaman-like practices dominated practical medicine. However, after this period of decline, progress followed. By the 14th–15th centuries, Europe witnessed cultural and economic revival, which contributed to the development of medicine. Religious restrictions weakened, and the sciences of anatomy and physiology advanced rapidly.

Andreas Vesalius (1514–1564) studied human anatomy and published “*De Humani Corporis Fabrica*” (1543). Leonardo da Vinci produced detailed drawings of the human skeleton, muscles, and internal organs. Miguel Servet discovered pulmonary circulation, while William Harvey described systemic blood circulation. Girolamo Fracastoro proposed that diseases were transmitted by microorganisms, and in his work “*De Contagione et Contagiosis Morbis*” (1546), he first suggested that infection spreads through invisible particles. Paracelsus pioneered the use of metals, salts, and plants in the preparation of medicines.

Henry de Mondeville, in his work “*Chirurgie*,” emphasized honesty in medical practice, stating: “A physician cannot deceive a patient” and “A physician must serve the patient, not money.” He was also one of the first to use opium as anesthesia during surgery. Ambroise Paré (1510–1590), a French surgeon, introduced the ligature technique, which replaced cauterization during operations.

The authorities played a significant role in the advancement of medicine. From the 14th century onward, the activities of physicians were placed under university supervision. Pope Clement VI supported physicians and contributed to the development of the field. A set of ethical principles was introduced for physicians:

1. Confidentiality — protecting the patient’s privacy
2. Justice — providing equal care to the rich and the poor
3. Honesty — not demanding unnecessary payment
4. Charity — providing free care to those in need

DEVELOPMENT OF PHYSIOLOGY:

During the Renaissance, along with the study of human anatomy, the science of physiology also developed. The creation of this field is associated with the renowned English scholar William Harvey. Harvey devoted his entire life to advancing physiology and elevated it to the status of an independent science. Although physiological observations had been conducted previously, the field had not been formally systematized before Harvey.



DEVELOPMENT OF ANATOMY AS A SCIENCE:

Although anatomical observations date back to ancient times, the lack of advanced research methods and the limited number of dissections hindered the full description of human anatomy. During the Renaissance, anatomy became an independent science, largely through the work of Andreas Vesalius, who is considered the founder of modern human anatomy. Vesalius corrected numerous errors present in earlier works — for example, Galen’s anatomy contained more than 100 mistakes. Vesalius dissected hundreds of cadavers and spent five years compiling his seven-volume work “On the Structure of the Human Body.”

MEDICAL DEVELOPMENT IN CENTRAL ASIA:

During the Timurid era, significant social and cultural development took place. Under the Timurid dynasty (14th–15th centuries), cities such as Samarkand, Bukhara, Herat, and Tashkent became major centers of science, culture, and medicine. Amir Temur and his descendants supported scholars, physicians, and philosophers.

Alongside Ulug‘bek’s observatory in Samarkand, medical schools also functioned effectively. Eastern medicine during this period developed based on the traditions of Hippocrates and Ibn Sina. Ibn Sina’s “The Canon of Medicine” (Al-Qanun fi’t-tibb) was taught and widely applied throughout the Muslim world and remained the primary medical manual even in Europe until the 17th century.

In Samarkand and Herat, major medical centers operated. Many renowned physicians emerged from the region:

- Burhoniddin Nafis authored “Sharh al-Qanun,” a commentary on Ibn Sina’s “Canon.”
- Mahmud ibn Umar Chag‘miniy wrote important works such as “Al-Qanuncha” and “Mulakhkhas fi’l-hay’a.”
- The ideas of Abu Bakr ar-Rozi (Rhazes) were widely adopted.
- Scholars such as Ali ibn Husayn al-Ansoriy, Mulla Faizulloh Bukhariy, and Muhammad Hodi Samarqandiy contributed greatly to the scientific development of traditional medicine.

CONCLUSION:

During the Middle Ages, medical science entered a stage of rapid development, and intellectual exchange between the East and the West increased significantly. Knowledge of human anatomy and physiology expanded, scientific explanations for diseases developed, and treatment methods became more evidence-based. Particularly in Eastern regions such as Movarounnahr, Khurasan, and Iran, medicine reached its peak. Ibn Sina’s “The Canon of Medicine” remained the most influential medical text for centuries in both the East and the West. In Europe, the Renaissance marked the beginning of a new era in medical science. In other regions, such as Russia, medical



practice was primarily hereditary rather than academically trained. Nevertheless, this period marked a major turning point in the history of global medicine.

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