

The history of medicine as an academic discipline: traditions in clinical medical education and modern teaching methods

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Abstract. The authors examine current methodological issues, concerning the historical and contemporary significance of the history of medicine in the system of higher medical education and the development of doctors' professional competency. The fact that courses on the history of medicine traditionally have had a dual nature in the framework of the educational process is demonstrated.

At present, methodically it is part of a general theoretical block of fundamental disciplines, methodologically continuing to solve issues as a propaedeutic discipline, ensuring continuity not only between curriculum subjects in one specialization but also between different levels of medical higher education. As an educational course, the history of medicine aims to provide future specialists with an integrated understanding of the complex structure of medicine as a science and the theoretical and methodological foundations of its research activities. This course is based on a comprehensive study of the mutual interaction of the natural sciences, humanities and clinical knowledge in all historical stages of scientific development. The propaedeutic nature of the history of medicine prepares students for a deeper study of specialized disciplines, provides for the development of professional competencies, and gives them a holistic picture of doctors' activities, their skills and responsibilities. The authors identify current approaches to the teaching of the history of medicine, aiding the fullest development of students' critical thinking and the professional development of their personal qualities. It has been concluded that the history of medicine, as a part of the history of science since the 19th century, is a unique course in the system of national medical education, forming an understanding of the importance of logic and ontology in the professional thinking of the doctor of the future.

Keywords: history of medicine, educational process, history and philosophy of science, educational technologies, competency approach

For quotation: *Shok N.P., Sergeeva M.S. The history of medicine as an academic discipline: traditions in clinical medical education and modern teaching method. History of Medicine. 2016. Vol. 3. № 1. P. 37–54.*

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Introduction

Reflecting on the content of the history of medicine as an academic discipline, we reflect on how to make sense of medicine as a subject of historical research and in this context, to structure a training course in a methodologically correct way in accordance with the requirements of the modern educational process. The history of medicine, as part of the history of science, presupposes the complex nature of establishing research problems, which in turn determines

the methodology's interdisciplinary nature [1–7]. This principle must be taken into account in the formation of the discipline's educational program and the development of methods for the organization of students' independent work. All components of the modern work programme for a history of medicine course should be aimed at forming a holistic view of the origin and development of medical science in different historical stages. Medicine is simultaneously both a fundamental and applied science, it remarkably combines theoretical general scientific knowledge, concepts, technology, skills and the doctor's art [1–4]. The study of the circumstances of the origin, formation and development of

Received: 01.02.16.

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medical science (as a specific field in the history of science) and practical knowledge (as the “art of healing”) as a whole comprises the scope of activities of historians of medicine. However, in presenting the nature of our subject, we cannot approach the history of medicine as we would the history of the “art of healing”, which only requires that information be presented with a reference-material approach. In turn, the history of science requires a precise periodization, scientific criteria, accurate knowledge that forms the vector of cognitive activity for future research. An analysis of the ideological and philosophical foundations of past doctors’ thinking can reveal their epistemological value to the structure of development of rational thinking in medicine. Implementing such scientific research methodology in the educational process raises the question of the structure of the course in a different manner, its methodical content and the choice of educational techniques (as N.I. Pirogov said, “the scientific field should guide the teaching...”) [8, p. 384].

The history of medicine and tasks of the modern educational process

The main purpose of reforms in the higher education system is to achieve a new level of quality, based on an effective network of universities corresponding to the internal demands of state policy and the highest international academic standards.¹ A flexible interdisciplinary educational

¹ Field of Science and Technology (FOS) Classification 2007 http://www.stat.fi/meta/luokitukset/tieteenala/001-2007/index_en.html (access date: 11.02.2016); International Standard Classification of Education ISCED 2011. UNESCO Institute for Statistics. <http://www.uis.unesco.org/education/documents/isced-2011-ru.pdf>; RF Government Decree of 24.09.2013 number 842 (ed. Of 30.07.2014) “On the procedure for the award of degrees” (with the “Regulation on the awarding of academic degrees”) http://www.consultant.ru/document/cons_doc_LAW_152458/; LAW_152458 /; Order of the RF Ministry of Education and Science on September 12, 2013 № 1061 “On approval of the list of specialties and areas of training of higher education” (with amendments of October 1, 2015). <http://docs.cntd.ru/document/499045862>. Federal Law of 21.11.2011 No. 323-FZ (as amended on 29.12.2015.) “On the basis of public health protection in the Russian Federation” (with amendments and additions, entered into force on 01.01.2016) http://www.consultant.ru/document/cons_doc_law_121895/; The federal law from 29.12.2012 N 273-FZ (as amended on 12.30.2015.) “On Ed-

environment, formed on the basis of the integration of large higher education institutes and created on this basis of innovative educational clusters, places new demands on the organization and maintenance of the learning process by actively implementing effective educational techniques and practices. The creation of integrated groups of specializations and areas of higher education training² demands a more careful approach to the formation of the list of competencies mastered in the framework of educational programs. The history of medicine is no exception: the prevailing conditions clearly reveal its uniqueness as a teaching course and a scientific specialization. Its complex interdisciplinary nature is an important quality, which certainly makes the history of medicine indispensable in the structure of modern training of highly qualified specialists with medical education. A historically formed approach to a discipline such as an introduction to medical science, its encyclopedic character, set down in the 19th century by the professors of the Imperial Moscow University (IMU) enables students to master the logic behind the historical development of clinical thinking and rational knowledge in medicine.

The strategic objectives for the development of medical science’s staffing potential are ensuring the conditions for effective development of scientific and scientific-pedagogical staff, identifying talented young people at all stages of education, ensuring the development of scientific schools and preserving the traditions of Russian clinical education.³ To ensure this it is necessary to modernize the learning process’ scientific and

ucation in the Russian Federation” http://www.consultant.ru/document/cons_doc_LAW_140174/; decree of the Russian Federation of December 28, 2012 № 2580-p “Strategy of development of medical science in the Russian Federation for the period up to 2025” <http://www.rosminzdrav.ru/documents/5413-rasporyazhenie-pravitelstva-rossiyskoy-federatsii-ot-28-dekabrya-2012-g-n-2580-r>. Last access date: 29/1/2016

² In the area of health and medical sciences: 30.00.00 “Fundamental medicine” 31.00.00 “Clinical Medicine”, 32.00.00 “Science of health and preventive medicine,” 33.05.00 “Pharmacy”.

³ Order of the Russian Federation from December 28, 2012 N 2580-p “Strategy for development of medical science in the Russian Federation for the period up to 2025” <http://www.rosminzdrav.ru/documents/5413-rasporyazhenie-pravitelstva-rossiyskoy-federatsii-ot-28-dekabrya-2012-gn-2580-r>. Last access date: 29/1/2016

methodological base through the integration of research and educational programs. Understanding the history of scientific learning methods, the laws of ontology and questions of epistemology in the history of medicine and other scientific disciplines, and their coordination, will ensure the formation of the skills and abilities necessary to carry out independent research on any clinical specialization. According to the prominent Russian surgeon N.I. Pirogov, “the special development of one area of any science”, including, we believe, the study of its history, can most clearly demonstrate “that sciences do not just border one another but are integrated and penetrate each other” [9, p. 1].

In 19th century Russia, at the Medical Faculty of the IMU (the successor of which is the I.M. Sechenov First Moscow State Medical University), a fundamentally new approach to the organization of the educational process was introduced. The basis for the new educational ideology was the principles of continuity and a stage-by-stage approach to theoretical and clinical training. In practice, this meant the abandonment of linearity in the educational process (i.e., the progressive transition from secondary to clinical disciplines) in favor of block schedules of thematic educational units. This approach to the organization of the curriculum allowed the distribution of disciplines’ focus to be shifted and ensured the transition to clinical training at an earlier stage due to the semester allocation of the majority of subjects without them being restricted to specific groups of general education, natural sciences, basic sciences and clinical disciplines, but rather depending on their value in addressing the specific educational objectives. The history of medicine course originated in Russia in the first decades of the IMU’s existence and was originally taught as part of other disciplines in the Faculty of Medicine. For a long time the teachers of this discipline were representatives of clinical areas (general therapy, forensic medicine, physiology, surgical pathology, nervous system and mental diseases). The history of medicine⁴ was taught as a third-year course, while in the first year (in the general theoretical unit), a course on encyclopedia of medicine was taught. It was in this way that “training in the full range of knowledge” in the

field of medicine was conducted, and students developed a systematic view of the discipline’s history and its component parts. In other words, in the 19th century the dual nature of the history of medicine was laid out: while it was part of a general theoretical fundamental unit, at the same time it was also a propaedeutic discipline. This provided for an interdisciplinary perspective on the history of individual clinical specializations and an understanding of their interrelations, ensuring the formation of a holistic view of medicine.⁵

The current structure of education presupposes a more complex organizational model: secondary vocational education; higher education – bachelor’s, master’s, specialist, training scientific-pedagogical (teaching) personnel for higher qualifications – graduate programs⁶; additional professional education – residencies⁷ providing for additional professional specializations.⁸ In the medical education

⁵ We stress that our findings are based on two centuries of teaching the history of medicine at the I.M. Sechenov First Moscow State Medical University (formerly the Imperial Medical University, Moscow Medical Institute, 1st Moscow Order of Lenin Medical Institute, I.M. Sechenov Moscow Medical Academy).

⁶ In accordance with the law “On education in the Russian Federation” post-graduate becomes the third level of higher education, which determines major changes in the whole system of training scientific and scientific-pedagogical personnel.

⁷ In accordance with the Federal Law of 21.11.2011 No. 323-FZ (ed. of 29.12.2015) “On the basis of public health protection in the Russian Federation” (with revisions and additions that came into force from 01.01.2016) from September 1, 2016, internships – conducted at medical institutions under the supervision and guidance of the relevant university department after passing state exams – are canceled as a primary postgraduate specialization for medical institution graduates of one of the medical professions.

⁸ RF Government Decree of 24.09.2013 No. 842 (ed. of 30.07.2014) “On the procedure for the awarding of degrees” (with the “Regulation on the awarding of academic degrees”) http://www.consultant.ru/document/cons_doc_LAW_152458/; RF Ministry of Education and Science Decree of September 12, 2013 № 1061 “On approval of the list of specialties and areas of training of higher education” (with amendments of October 1, 2015). <http://docs.cntd.ru/document/499045862>; Federal Law of 21.11.2011 No. 323-FZ (as amended on 29.12.2015) “On the basis of public health protection in the Russian Federation” (with changes and amendments, entered into force on 01.01.2016) http://www.consultant.ru/document/cons_doc_law_121895/; Federal Law of 29.12.2012 No. 273-FZ (ed. 30.12.2015) “On Education in the Russian Federation” http://www.consultant.ru/document/cons_doc_LAW_140174/. Last access date: 29/1/2016

⁴ At the beginning of the 20th century the course was called a “Systematic course on the history of medicine”.

system today, the history of medicine exists in the structure of the curriculum at every stage (this function has been introduced as part of the specialization). For example, in the first stage of higher professional education (“specialization”), the history of medicine is taught, usually during the first and second years at medical faculties,⁹ and in the postgraduate course program History of Medical Science, which is also taught in the first year as part of the discipline “History and Philosophy of Science” and provides for the study of the general theoretical foundations for scientific research methodology in the history of medical development. As part of the development of doctoral programs for health professions, the importance of the history of medicine as a theoretical, methodological and general scientific foundation is testified by its inclusion in the completion requirements for the doctoral thesis program: the development of “a number of theoretical propositions, the total of which could be qualified as a scientific achievement”.¹⁰

Thus, the study of the history and development of methods for scientific knowledge in medicine has become progressively more complex at different stages of professional education, integrating the history of different disciplines and different clinical specialties.¹¹ This is achieved as a result of the interdisciplinary nature of the history of medicine course, which is made up of several methodological components that are significant for the educational process. Firstly, there is its systematic and encyclopedic nature (due to it being part of the history and philosophy of science) [2]. Secondly, there is the formation of a world view based on an understanding of the continuity of the development of modern scientific medicine and rational medicine from preceding centuries [1]. This is achieved by understanding the specific character of medicine as a science. The development of rational methods

of knowledge for medicine is based on the assumption that a scientist can form knowledge corresponding to objective reality (i.e., true knowledge) about the human body, its structure and diseases on the basis of indirect “visible” or “tangible” signs that characterize the current state of the body. Thirdly, the history of medicine as part of the history of science offers the scientist a manifold intellectual challenge, requiring the use of a wide range of research tools – from an arsenal of sources to interpretive analysis, in which sometimes an understanding of the connection between events from completely different ages is required, while furthermore understanding the laws of development for various clinical specializations [2]. The current state of various clinical disciplines is often linearly interpreted by researchers outside of the context of their ontological development. This problem is solved in the framework of courses on the history of the individual sciences, which largely present the history of the origin and development of research methods. However, in studying the history of science there is almost always a temptation to cover as many dates and events as possible, presenting the names of scientists and their inventions and discoveries. All these are striking examples of a phenomenological approach¹² to the history of medicine that does not provide for a holistic view of trends in the development of scientific knowledge, devaluing the meaning of discipline. Scientists’ proper understanding of content and place in the history of natural science in general and medicine in particular is impossible without a clear awareness of the recentness of their work, and thus the ability to distinguish their methodology from the methodology of their predecessors or opponents. The fact of a scientific revolution, carried out by a scientist, must be proved in the context of the overall development of a particular discipline, which is impossible without an understanding of general theoretical and methodological context. The modern

⁹ At the I.M. Sechenov First Moscow State Medical University, the discipline is included in the 1st year study program.

¹⁰ RF Government Decree of 24.09.2013 No. 842 (ed. of 30.07.2014) “On the procedure for the awarding of academic degrees” (with the “Regulation on the awarding of academic degrees”) http://www.consultant.ru/document/cons_doc_LAW_152458. Last access date: 29/1/2016

¹¹ The experience of the I.M. Sechenov First Moscow State Medical University confirms this.

¹² For example, the only existing textbook on the history of medicine, prepared by Professor T.S. Sorokina (“History of Medicine”, 1st edition – 1992, 9th edition – 2014), is overloaded with facts concerning not only the history of the specialization, but also a general history, listed without logical connections and conclusions, making it difficult to remember and evaluate its importance for the further development of medicine as a science.

approach to the history of medicine in the early 19th century was formulated by the creator of one of the first Russian-language textbooks on the history of medicine – L.Z. Morokhovets: “Almost all the textbooks on the history of medicine are nothing more than an endless string of biographies of prominent doctors, biographies arranged in chronological order divided into groups whose members are often linked by nothing else but political and geographical conditions. It is clear that when reading these textbooks, attention and thought quickly fade, and the guiding thought that originated in the first pages quickly breaks down into endless biographical data without continuity, often presenting an overly diverse range of material. For beginners, such presentation is extremely difficult... That is why there is no rush to get acquainted with the history of medicine... If the chronological order does not satisfy the novice, then even less does it satisfy his systematic grasp of the history of medicine, failing to present a summary of scientific and medical disciplines, but rather only a history of the practical fields of the medical arts, the so-called medical specializations, where it is even less possible to form a clear picture of the development of medical knowledge” [10, c. XV].

Today it is important to understand that both the study and the teaching of the history of medicine should be guided by general scientific principles of historicism and systematization, concepts of the history and philosophy of science (for example, “paradigm,” “normal science” and “scientific revolution”, “types of scientific rationality”, “scientific world view” of the researcher and others), studying the philosophical and ideological foundation of works of prominent physicians of the past, attempting to analyze the logic of continuity in the development of rational methods of knowledge in medicine and using a wide range of scientific methods of research. Thus, in studying the history of medicine course, the doctor of the future should form an understanding that ancient medicine, the medicine of the 19th century and modern medicine are not mutually exclusive forms of the same branch of knowledge. The thought processes of doctors from different historical stages, which determined the later development of medical science (Hippocrates, Galen, K. Rokitsansky, S.P. Botkin, Pirogov, B.V. Petrovsky and others), is characterized

by a deep embracing of experimental research, undertaken by a doctor and aimed at studying the various problems associated with medical practice. The priority of doctors’ clinical practice in different eras is closely related to conceptual practices, and this relationship lets us describe a method’s value for the development of medicine.

The history of medicine and philosophy of science

Understanding the history of medicine as part of a fundamental field in the History and Philosophy of Science determines its special role in the educational process and the formation of the clinical doctor’s mindset. At the same time the applied and fundamental nature of medicine as a science, its close relationship with ethics, based on the need for individualization of each case in a physician’s clinical practice, necessitate the assimilation of sociocultural and ideological dominant ideas that imbue the social dimension of medicine and act as a significant determinant for the practicing physician. As noted by the eminent 19th-century physician G.A. Zakharin, “students’ assimilation of technique and ability to personalize it should be a teacher’s main aim ... those who have learned the techniques and skills to individualize are those who find their way in any new case ...” [13, p. 1] Here there is a close link between philosophy and clinical medicine: the relationship of the part and the whole, the general and particular – these basic philosophical categories in the interpretation of the conceptual apparatus of medical practice and general pathology provide the right approach to the diagnosis and treatment of diseases. First of all, this is defined by the fact that medical theory is always located within the general field of the ideas that form medical philosophy, which provides for the integrated study of a complex living organism – the human body. Botkin, the outstanding clinician and creator of the doctrine of the body as a whole, noted: “The study of the interaction of a person and the surrounding natural environment, with a view to preventing disease, treating or alleviating it, is that branch of human knowledge known by the name of medicine” [14, p. 9].

Understanding the developmental patterns of a scientific branch of knowledge is fundamental to the formation of the educational environment.

Methodology, which has not lost relevance in the modern educational process, continues the tradition of medical education, formed in the 19th century. Pirogov defined the value of such an approach as follows: “Direction is given to science by the very property of the object of science, the prevailing beliefs of scientific figures and historical events in matters of science ... In the development of almost every science, all three of these conditions are met, giving it a particular direction. They are all dependent on each other. The genuine quality of the object of each science, which at first is not clearly defined in adherents’ convictions, is clarified little by little, due to the progress of other sciences and the results of their discoveries, sometimes purely randomly ...” [8, p. 385–386]. That is why it is so important for the development of modern medical knowledge and the adjacent areas of science that there is a clear idea of how the historical formation of medicine took place, the role of particular circumstances, ensuring breakthroughs in individual clinical disciplines – for as Pirogov correctly noted, in studying the details meticulously, we can discover the whole.

Because of its close connection with the philosophy of science, as part of the educational process the history of medicine lets interdisciplinarity be used for an integrated approach, forming the methodological basis for fundamental clinical investigation. An interdisciplinary approach connects the seemingly isolated systems of specific scientific disciplines (or history of individual clinical specializations). In these studies, there are always the “main” and “associated” disciplines that at different stages can be interchanged. The interchanging of positions is achieved by the transfer of research methods from one discipline to another, while not leading to a change in the object of investigation. Such extrapolation relies on the discovery of similarities in the objects being investigated in the field. Here is an example: despite the fact that the circulatory system is well described by Galen on the basis of his medical knowledge gained in the course of medical practice, it only underscores and does not alter the fact of his use of logic and philosophy [1, p. 26]. He demonstrated how the synthesis of natural-philosophical foundations of rational knowledge in order to develop the

theory and practice of medicine can take place. The interdisciplinary approach allows us to solve problems in which the “main” discipline (in our case the history of medicine) experiences conceptual and methodological difficulties. As a result, that which is obtained with the help of “related” disciplines is interpreted from the perspective of a “main” disciplinary approach. When comparing the results of disciplinary research, new similarities in subject areas being studied are found, which provides comprehensive scientific knowledge. For example, in a very specific (disciplinary) approach to study the legacy of such a difficult to understand author such as Galen, there may be significant discrepancies in the interpretation of meanings embodied in its texts (for example, using philological methods separately from medical, philosophical and historical). Galen’s treatise “On the doctrines of Hippocrates and Plato” is a prime example of how the results of anatomical dissections may be related to the analysis of the consistency of certain natural-philosophical ideas. Thus, the study of Galen’s legacy may be purely interdisciplinary in nature.¹³

In recent decades, the history of medicine has been dominated by a trend towards highly specialized analysis. This can be easily explained: of priority interest are those events that directly influenced the modern image of medical science (theory and practice). In this context, an emphasis on continuity in the development of healing methods, the continuing validity of clinical observations of ancient researchers holds great importance to modern researchers. The perception of an indissoluble connection between generations of doctors (from the time of Hippocrates to the present day) is a characteristic feature of the history of medicine. In modern Russian historiography, we find extensive research on the history of surgery, cardiology, immunology, establishment of medical education, etc. A chronological framework which, for obvious reasons, covers the 19th to 20th centuries, and the events of earlier eras are covered very rarely. In most cases, the objects of this research are

¹³ The study of Galen’s legacy in this field has been successfully conducted at the Department of the History of Medicine, National History and Culturology at the I.M. Sechenov First Moscow State Medical University.

analyzed through the prism of a phenomenological approach: techniques for treating various diseases and historical descriptions of different doctors are described. This approach leads the history of medicine being considered is the general context of the development of natural science, global social and cultural processes that have a decisive influence on the thinking of scientists and their research programs. Speaking about the history of a private scientific discovery or of the formation of general theoretical concepts in medicine (or, for example, in physics), we try to understand the “anatomy” of the researcher’s mindset, to understand how this or that idea came about, in what way a particular scientist conducted scientific research. Reconstruction of a scientist’s biography (peculiarities in education, information about family, social environment, etc.) has always been and will be the focus of historians of science. Professor D.A. Balalykin explains the use of this approach in the methodology of the history of medicine as follows: “...We are trying to answer for ourselves the question: ‘How did he come to make his discovery?’ Immediately following on from this the question arises: ‘And why was it him (and not someone else) and why in this place and at this time in particular (as opposed to some other place or time)?” [3, c. 10] In recent decades, historians of science are moving away from the old principle of presentism, which involves consideration of past events through the prism of the current state of a particular scientific discipline.¹⁴ The important scientific constant of the end of the 20th century, which greatly enriched the research potential of the history of science is offered by academic V.S. Stepin’s idea of different types of rationality [15, p. 506–542]. This concept explains the historical and scientific phenomena in all stages of the development of scientific knowledge, using the methodology of the philosophy of science. From the perspective of the concept of the modern history of science, scientists need to turn to the methodology of philosophy of science due to its objective relationship to objects of their study and the common pursuit of the ideal of rationality. The history of medicine at all stages of medical education provides for an

understanding of the priority and the leading role of philosophy in relation to specific scientific knowledge, in its self-sufficiency, as well as the substantial dependence of individual disciplines of philosophy as such.

The history of medicine as a propaedeutic and fundamental discipline

The acquisition of medical knowledge has always been associated with an acquaintance with the history of medicine. At present, the history of medicine as an academic discipline faces a fairly complex organizational and methodological challenge. On the one hand, the study of its subject matter is closely connected with the history of individual clinical disciplines, on the other – in its framework is found the idea of the special character of clinical thinking through an understanding of the interdisciplinary interaction between arts and sciences, which we mentioned earlier. Acquiring one’s own medical experience is impossible without a study of the experience and traditions of previous generations, and the formation of new knowledge is not possible without presuppositions (acceptance, critical thinking, the supplementation and improvement of previous intellectual experience). An example of this are the classic works of T. Kuhn and K. Popper which were dedicated to understanding the regularities in the history and philosophy of science [16–17]. A modern course in the history of medicine, based on general scientific and specialized methods of historical analysis defines the basic laws and stages in the formation and development of medicine.

In the first section of this article we discussed the particular importance of 19th century reforms for the development of national medical education. At this time, the history of medicine’s place in the curriculum structure was determined and the approach to teaching the discipline was formed. The university charter of 1884 secured the independence of the department of history and encyclopedia of medicine in the medical schools’ structure [18]. Unfortunately, in practice this is not lead to intensified research on the history of medicine

¹⁴ Note that this has been indicated in the past, by L.Z. Morokhovets for example [10, p. XV].

at the Imperial University.¹⁵ In our view, this could be due to several factors. First of all, due to the very intense nature of the development of clinical medicine in the 19th century (the current state of affairs in science generated great interest among physicians). Another important factor was the fact that for a long time there were no national traditions in the field of historical medicine research.¹⁶ Apparently, this can be explained by the fact that after the adoption of the Charter of the 1884, the department of history and encyclopedia of medicine at all of the imperial universities remained vacant for a long time. R. Cobert was appointed the first professor at the department of history of medicine (University of Dorpat, 1886).¹⁷ The department of history and encyclopedia of medicine at the Imperial Moscow University remained “vacant”¹⁸ right up to 1917.¹⁹ In 1897, professor of physiology Morokhovets began teaching the of history of medicine course, but he never became the professor for the department of history and encyclopedia of medicine. In 1903, he published his textbook *History and its Relation to Medical Knowledge*. M.U. Lakhtin, who actively studied the history of Russian medicine, took up the position of assistant professor at the department of the history of medicine at the Imperial Medical University in the 1902–1903 academic year [19–20].

¹⁵ According to the Journal of the Ministry of Education for 1884–1905 (Saint Petersburg, 1884–1905), 20 issues of “An overview of the teaching of science at the Imperial University of Moscow” for 1888–1917 (Moscow, 1889–1916), and 35 issues of “Report on the status and activities of the Imperial Moscow University” for 1876–1916 (Moscow, 1877–1916).

¹⁶ For example, the fundamental work of S.G. Kovner *History of Ancient Medicine*, published in several volumes in 1878–1890, was largely based on the works of Western scholars (C. Daremberg, J.-M. Guardia and others). In 1890, a translation of German medical historian H. Haeser *Fundamentals of the History of Medicine* was published.

¹⁷ Orders of the Minister of Education. Journal of the Ministry of Education. March 1886, Part CCXLIV. SPb., 1886. P. 17.

¹⁸ The department was considered vacant due to the fact that there was no professor.

¹⁹ According to 20 editions of “An overview of the teaching of science at the Imperial University of Moscow” for 1888–1917 (Moscow, 1889–1916), and 35 issues of “Report on the status and activities of the Imperial Moscow University” for 1876–1916 (Moscow, 1877–1916).

The study of the history of methodological approaches to the teaching of the history of medicine is interesting from the point of view of clarifying the circumstances of the formative approach to the history of medicine as a fundamental and propaedeutic discipline. This article discusses teaching traditions at Moscow university’s history of medicine course, the reconstruction of which is carried out on the basis of analysis of editions of “An overview of the teaching of science at the Imperial University of Moscow”, as well as content analysis of available textbooks, teaching aids and course programs produced at different historical eras.

We have found that Morokhovets in his lecture course recommended reading Gezer’s textbook, which was his only textbook translated at that time [21]. After the publication of *History and its Relation to Medical Knowledge*, both textbooks were recommended. The special character of Morokhovets’ book should be noted – in our opinion, for the first time in the history of domestic medicine a systematic approach was taken to describing of history of medical knowledge: “If the present does not give us the desired answer to many questions, and the future is hidden from us by a veil of uncertainty, it remains to turn to the past: what really was bears all the attributes of truth. History does not lie ... the study of history will ... in our hands is the criterion for understanding the path along which the further development of a particular doctrine will follow, the answer to a particular question, and yes, finally, the whole of medicine in its entirety! ...” [10, p. XIV].

Professor Morokhovets attempted to understand medical knowledge in all its complexity, defining a systematic approach as the primary approach when deciding on the formation of the history of medicine subject. This is largely a reflection of trends in national education traditions. Pirogov wrote of the difference between European (especially German) and Russian approaches to learning in some detail [9, p. 3]. It is quite ambivalent about the drive “in Germany, and even in France, by the most experienced professors ... to replace the systematic courses specialized [courses]”. Pirogov points out that “in Germany, with an abundance of intellectual capital, many fields of science are not presented in their entirety or

systematically, in Russia, with its poverty of this capital, science at all universities is presented not only systematically but in full". This, in his view, led to "extensive non-written study ... often to the detriment of clarity", while he was a supporter of the practical teaching with a lot of experiments and demonstrations. However, as we see it, demonstrations can not and should not replace a systemic vision of a subject. This what was confirmed by Pirogov himself. He said that was most important was to master technique and through the particulars know the whole. However, the systematic nature of experience in medical practice is as necessary as the system knowledge of medical theory, found in its basic principles. Experience does not replace comprehensive theoretical training, with the help of which is possible perhaps the most important thing in the medical profession – the formation of clinical thinking [9]. Morokhovets strove to instill this principle as the basis of his author's vision for the study of the history of medicine (in much of his work he relied heavily on the idea the role of the physiology): "To explore the physical construction of a person we draw upon materials from morphology, for the study of his life, comprised of phenomenology of an animal or his physiology, we derive material and criteria from physics and chemistry. Obviously, a broad natural history base alone can give us a clear idea of the health of our fellow man; but not only the healthy, but also for the ill, because only then can we know the patient, when we know healthy" [10, p. XIV]. Perhaps, from the point of view of the modern requirements for the creation of a history of medicine course, this approach seems somewhat one-sided, but it would be more accurate to say specialized, but Morokhovets attempted to identify something special in the medical knowledge that allowed him to present the specifics of its development in relation to general scientific trends in historical context.

Subsequently, the tradition of conceptualizing the basics of teaching the history of medicine has significantly changed in the 20th century. In 1954, the academic B.D. Petrov already published materials for the history of medicine course, which looks at it through the lens of a formational approach to history in an attempt to "connect the development of medicine with public life, with the changes

in the social system" [22, p. 20]. At the same time we see that in individual chapters, he recommends the works of his predecessors, who he criticized in numerous cases [22, p. 22]. In 1961, M.P. Multanovsky published a textbook in which an ideological approach to the history of medicine is consolidated, and is presented in a more fractured structure [23]. Medical development in Russia has a separate history from Western Europe, as well as a division of general and specific issues: "Specific considerations of individual medical disciplines, and specific historical and medical information relating to the various branches of medical science can not be covered in sufficient detail in a general course. The main departments of the medical institute (anatomy, physiology, pathology, internal medicine, surgery, paediatrics, hygiene) are tasked with introducing them" [23, p. 8]. Thus, there is a departure from systematic course presentation. Its propaedeutic component should, according to the author, be structured as part of the specialized subjects. The course acquires a reference and informational character. All subsequent educational publications reflect this approach to varying degrees. Unfortunately, during the Soviet period in Russia, the history of medicine lost its systemic "encyclopedic character" through the ideologization of education and the failure to make use of previously accumulated experience. This subsequently led to the dominance of the phenomenological approach in research and the devaluation of the discipline's content. In turn, this has led to the history of medicine course being shifted from the third year to the first in 2010. Today, the history of medicine's position in the structure of medical education is unstable. The general trend is for a reduction in the amount of hours allocated for this discipline, and for students of certain faculties – the classification of the history of medicine as a non-mandatory part of the curriculum. Thus, we see how an understanding of the value of the course's objectives are being gradually reduced – the formation of students' axiological element of medical practice, critical thinking, understanding of the unity of the system of medical knowledge and its interdependence [24].

In pedagogy, a traditional introduction to a profession is considered a propaedeutic course aimed at the systematization and assimilation of

existing knowledge for the subsequent formation of professional competence in the future expert. As has already been mentioned, since the 19th century in the traditions of national medical education there has existed the notion that a propaedeutic course is an introduction to a separate clinical discipline. Understanding the history of medicine as a discipline that has a propaedeutic purpose ensures the formation of a holistic view of medicine. Even Morokhovets noted that: “We were interested, first of all, in the consistent development of medical knowledge and medical ideas and furthermore historical figures have been presented to us only as milestones over the course of time. That is why in becoming acquainted with the history of medicine goes hand in hand – in parallel – with the physiological route by which a person becomes familiar with the natural environment – with the progress of knowledge in general” [10, p. XV]. A systematic approach to the teaching of the history of medicine, based on the clarification of the interrelationship of disciplines included in the curriculum lets students learn to apply the knowledge and skills obtained in the framework of a single discipline while studying the next discipline.

As a propaedeutic discipline the history of medicine at the present stage is an essential course for further development of professional competencies, that ensures and explains the logic and the integrity of the educational process. In this regard, the emphasis in the teaching of the history of medicine should focus on explaining the continuous connection between the structural elements of knowledge and forms of teaching and learning activities belonging to different disciplines included in the curriculum. However, its position in the curriculum (in the first year at medical faculties) determines this course’s orientation towards the systematic pre-training aimed at mastering new knowledge and understanding in the general medical training cycle. Under these conditions, the history of medicine serves to systematize, facilitate and motivate further learning of the foundations of medicine. The systematizing function is achieved through the introduction of students to medicine through familiar historical images that surround them and drawing on their existing knowledge and experience, both in life and in education. The facilitation function is connected with

the creation of more conducive conditions for an understanding of subjects and overcoming difficulties in learning. The motivating function is aimed at maintaining and developing students’ interest in specific clinical fields and overall learning. Therefore, it is appropriate to consider the history of medicine as a propaedeutic course and an important pedagogical stage in the development of medical students’ professional competence [25].

The complexity in achieving the history of medicine’s goals can be explained by the fact that it is necessary to explain the basic idea of the history of clinical and scientific medicine to students who actually still do not know professional terminology, do not know anatomy, physiology, biochemistry, microbiology, therapy, surgery and so on. At the same time the history of medicine cannot be reduced to just a list of the names of great doctors and medical ideas. It should consider medicine as part of the history of science, explain the logic of discovery, the preconditions for their appearance, the influence exerted on the medical field by particular historical periods, the importance of these discoveries in a historical perspective and as a social institution as well as a special cultural phenomenon.

Theoretical and methodological disunity in branches of medical science, clinical and theoretical disciplines, as well as underestimating the humanitarian component in medical education reduces the effectiveness of scientific research. The extensive nature of high-tech medicine’s development sets goals in a new way for clinical medicine and the realities of conducting medical activities. New technologies offer a wide range of successful methods in the struggle with complications of diseases, but they also demand a new approach to ethical issues (from the modes of professional communication to the principles of interaction between doctor and patient). With regard to the education system, this means that without a smart doctor existing techniques are dead. The issue of preventing the system functioning in such a way that it could one day exhaust itself on the basis of its own principles, is very important for medical education today. In other words, the level of medical development should not let future specialists feel that ethical issues and the principles of treatment according to Hippocrates are outdated. The aim of medical

education is to form and develop specialists' critical thinking: technology and machinery are, of course, important, but the results of numerous studies and movements provide only "material" on which a particular doctor makes a diagnosis and prescribes treatment. Traditional medical education, focusing on the formation of clinical thinking, a systemic view of etiology and pathogenesis, and a complex understanding of the system of nosological entities, cannot be replaced by the development of innovative technologies.

Because of this, when you create a teaching course for the history of medicine you need to take into account a number of building principles for the propaedeutic course (cognition, integration, periodicity, initiation of cognitive activity and consistency, fragmentation, continuity and professional orientation). These provide support to the student experience (academic and personal) and direction to the formation of the main concepts in his or her professional competences. Thus, the developmental complexity of the discipline is determined not only by the special nature of the methodology's formation, but also, as a consequence, the choice of methods that are the most effective for its assimilation in the modern educational process.

The history of medicine and the latest educational technology

One of the tasks of the modern educational process is to increase the effectiveness of teaching activities and student learning. The main goal in implementing Federal State Education Standards for Higher Education 3+²⁰ in the preparation of medical school graduates is the creation of competent professionals. As a result, the conditions need to be created for the formation of a proactive stance by students. On the one hand, this is achieved by introducing innovative technologies into the educational process focused on the individual, with ability to work effectively with information and possessing various methods for obtaining it. On the other hand, a competency-based approach in medical education should be aimed at a reflective

assessment of a future doctor's capacity.²¹ In the process of teaching the history of medicine, the teacher poses a number of goals for the formation of the students' total common cultural, general professional and profession competences. As a result, together with the necessary amount of knowledge, the future specialist should form an approach for its practical application, the result of which is the acquisition of diversified experience. The criterion for the future specialist's training in higher education must be professional competence, a capacity for active social adaptation, the ability to make independent life choices, a readiness to enter the workforce and to continue improving professional skills, i.e. with specialist training and the able to work under new conditions [29–30].

The implementation of interdisciplinary and integrated function of the history of medicine, as well as a competency-based approach in the teaching of the course has a certain effect on teacher requirements as the organizer of the learning process. With the amount of classroom work declining and the proportion of students' independent work increasing, teachers have to organize the learning process to maximize the goals achieved in the of history of medicine course.²² The success of teaching the history of medicine and training of professional specialists on the whole is largely a result of how the learning process is successfully constructed (using basic teaching techniques and taking into account the particular psychological and pedagogical requirements of the medical school's educational process).

In accordance with the Federal State Education Standards for Higher Education 3+ by the end of training the medical school graduate should have acquired the knowledge and skills necessary to conduct medical, organizational, managerial and research activities. Each of these

²⁰ Federal State Education Standards for Higher Education 3+ – The federal state educational standards for the higher education of a new generation.

²¹ Field of Science and Technology (FOS) Classification 2007 http://www.stat.fi/meta/luokitukset/tieteenala/001-2007/index_en.html (access date: 11.02.2016); International Standard Classification of Education ISCED 2011. UNESCO Institute for Statistics. <http://www.uis.unesco.org/education/documents/isced-2011-ru.pdf>. last access date: 29/1/2016 See also [26] and [28].

²² The main direction in modern Federal State Education Standards is a reduction of classroom hours workload and an increase in independent work by about 40 percent.

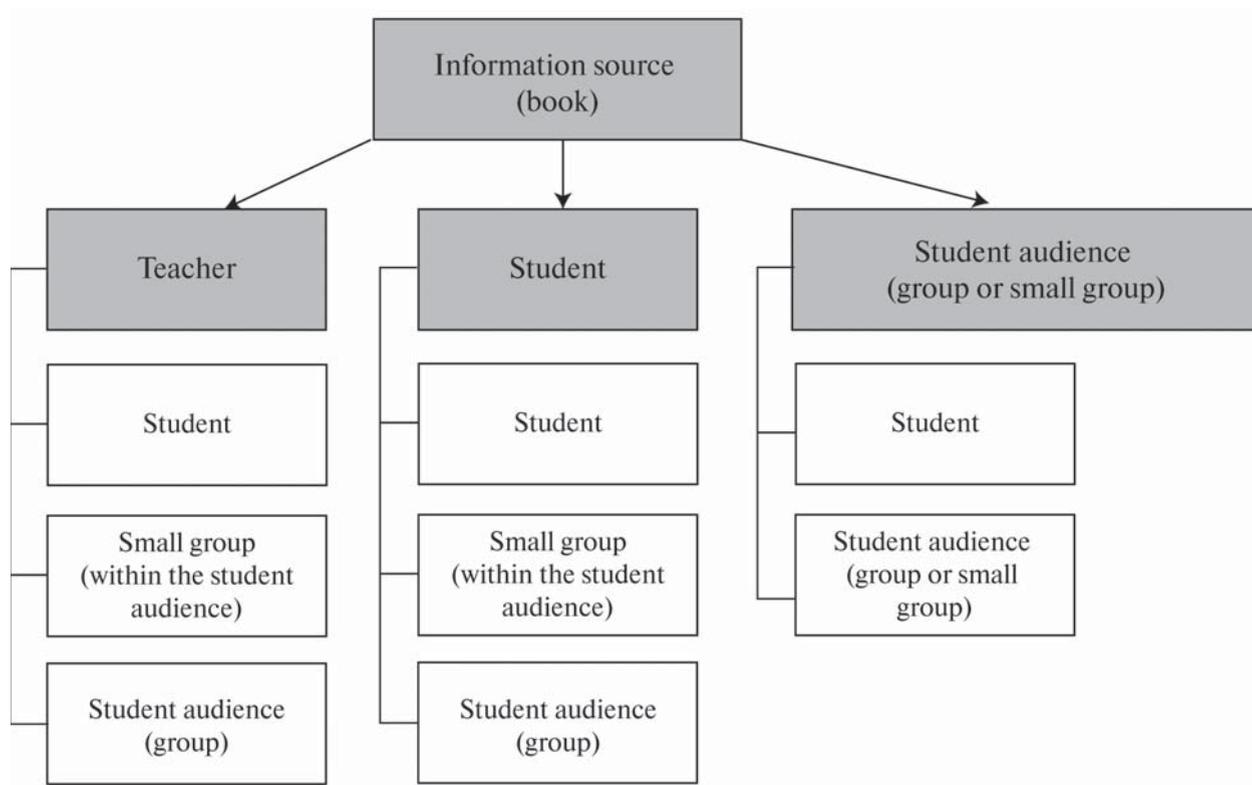


Fig. 1. The focus of teaching techniques in the educational process for the history of medicine.

types of activities offers a set of methods, means and approaches to influencing objects (systems, subjects, phenomena, processes, and so on) for professional activities with the goal of changing and transforming it. In the training of future doctors the most important thing should be the principles of consciousness and activities that ensure an active social position and successful intellectual activity, as well as the possibility for creative development in the chosen field of activity. The pedagogical interaction between all members of the educational process, in which there may be different subject-object relations (Fig. 1) plays an important role in the process of mastering the basics of professional competence.

The formation of a competent professional with an active social and professional position is impossible without the educational process' harmonious use of a cognitive, operational-activity and individual-centered model of learning. Selecting a specific teaching model depends on the age of the students, and the teachers' professionalism and qualifications, the discipline's specific educational requirements

and the training facilities and equipment being used. With junior courses, the use of cognitive models may predominate while in the study of fundamental disciplines (pathophysiology, pharmacology, general surgery and others) operational-activity-related models may prevail and with clinical disciplines (hospital treatment, obstetrics and gynecology, clinical pharmacology, surgery and hospital, etc) – individual focused models. Preparing postgraduates should be based on operational-activity-related and individual-focused techniques.

The history of medicine as a discipline is a unique course that explains not only the history of the formation of professional disciplines, but also the relationship between all the disciplines that make up the curriculum. For example, relying on knowledge of natural sciences and the philosophical principles of rationality, the history of medicine explains the historical development logic behind basic medical disciplines such as anatomy, its division into pathological and topographical, as well as their mutual influence on the development and differentiation of clinical

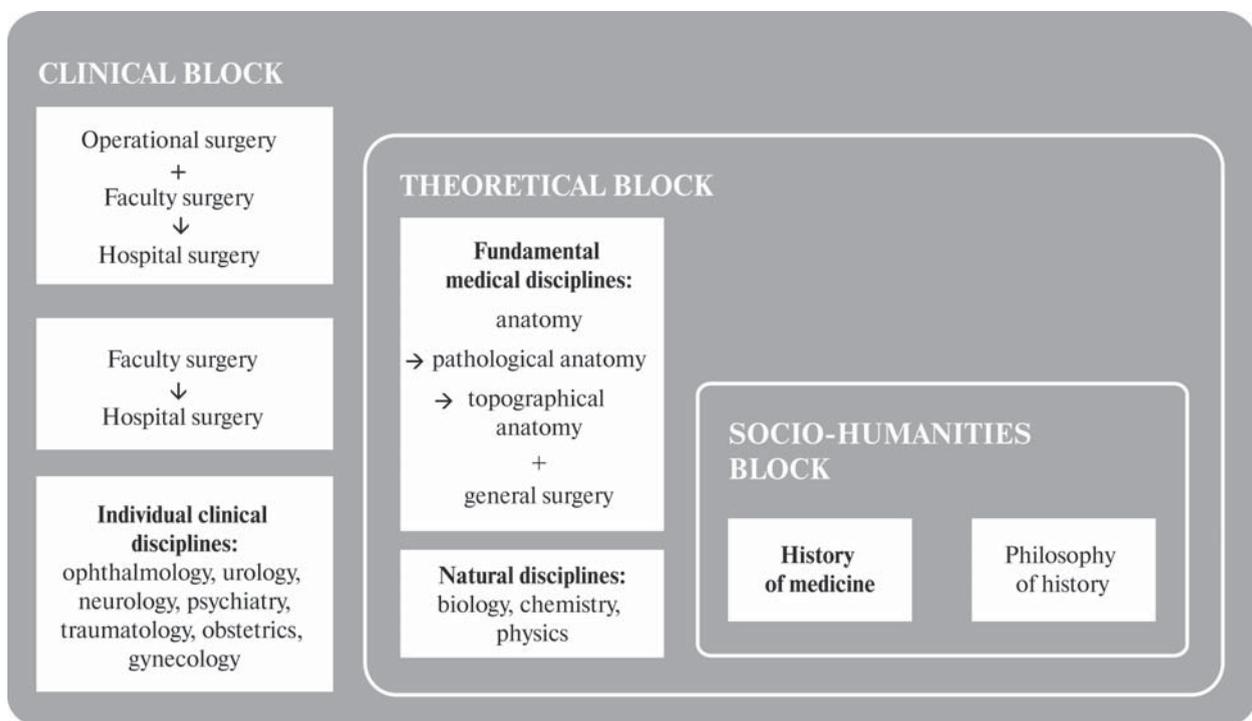


Fig. 2. The history of medicine's integrating function in the system of higher medical education.

disciplines, such as surgery – operational, faculty and hospital (Fig. 2).

The forming of the educational process in accordance with an understanding of basic methodological attitudes about the role of the course in the training of specialists with higher medical education provides for the combining of different models of learning, characterized by certain objectives, content, methods and teaching aids. This approach has led to the department of the history of medicine, history and culture of the fatherland at the I.M. Sechenov First Moscow State Medical University to create an original work program (see. table) and introduce into the curriculum innovative teaching methods, and to develop various assignments oriented towards combining the departments' unique scientific research developments, the goals of the modern educational process, student learning goals and traditions of teaching the history of medicine, incorporated into university in the 19th century.

The creation of the curriculum on the principles of interpenetration, the alternating and permanent combination of different types of tasks (archive work, compiling annotated reviews, conference presentations, round tables or business

exercises, and more) not only integrates students' classroom and extracurricular work, but also can be used for different models of learning. Within the framework of round tables and business exercises during seminars, the focus is upon solving real or simulated medical situations that resemble as close as possible to professional activities. Preparations for conference presentations focus on solving a particular historical and scientific problem or task, which is the goal of the source or historiographical research. This provides for building an interaction between teacher and students following principles of partnership, co-creation and collaboration.

The application of a cognitive learning model is aimed at the acquisition of knowledge and skills in the subject content of the history of medicine course (acquisition of a fixed volume of information) [31]. As a result, the student acquires the discipline's necessary knowledge base, the scope of which is a criterion for evaluating its performance. This model of educational interaction between students and teachers relates to classical traditional teaching, in which, in addition to passive teaching methods, the use of active teaching methods to stimulate students'

**The breakdown of lecture and seminar themes according to the working program
for the discipline of the history of medicine***

Lecture topics	Seminar topics
History of medicine as part of the history of science. The emergence of medicine	The practice of medicine in the civilizations of the ancient East. Natural-science and medical understanding, as an integral part of the nature of civilization and culture. Magic and rational medicine
The medicine of antiquity – the first anatomical and physiological concepts	The origin of ancient Greek rational medicine. Hippocrates. The main medical schools of antiquity
	Galen. The first dominant theoretical and practical system in the history of medicine.
	Galenism in the Byzantine-Arab and Western European medieval traditions (until the 15th century)
The birth of a new medical paradigm in Western Europe in the 15th-16th centuries. The general historical and methodological background of the scientific revolution and progress in medicine of the 17th to the first half of the 19th century	The development of clinical medicine in Europe in the 18th century.
	Formation of medical affairs in the Russian state up to the 18th century. The development of state and secular medicine. Medical education in the Russian State
Development of the worldwide theoretical medicine in the second half of the 19th century	The development of theoretical medicine in Europe in the 19th century
	The origins of the domestic medical science, the development of Russian theoretical medicine in the 19th century
The development of the worldwide clinical medicine in the second half of the 19th century	The development of clinical and preventative medicine in Western Europe in the second half of the 19th century.
	The development of clinical and preventative medicine in Russia in the second half of the 19th century
The development of worldwide theoretical and clinical medicine in the 20th century	Topical issues in development of medicine in the 20th century
	Examination – centralized testing

Notes. Developed at the Department of the History of Medicine, National History and Culturology at the I.M. Sechenov First Moscow State Medical University, Russian Ministry of Health for specialization 31.05.31 “Medical business”.

independent work (for example, the study of sources, selection and analysis of historiography, annotated articles, and more.) is possible.²³

The main problem, which is most acutely felt in seminars, is a lack of time, as a result of which demonstrating the use of theoretical

²³ Within the framework of this publication, we do not have the opportunity to elaborate on all the innovative methods for organizing students' independent work, developed at the Department of History of Medicine, National History and Culturology of I.M. Sechenov First Moscow State Medical University.

knowledge and its the fundamental importance is possible only in a fragmented way, using specific examples. As a result, students acquire the ability to apply this knowledge only in their senior years. A key problem associated with this is “information loss” during training. In studying the history of medicine, students become alienated from the learning process due to its data being unsupported by practical relevance and significance for further practical activity. It is difficult to understand due to 1st year students' lack of basic medical, biological

and clinical knowledge, terms that are difficult to remember and often outdated, the problem of comparing scientific knowledge from different historical stages. All this reduces its efficiency and places obstacles on the path to knowledge. Therefore, in the work program, developed at the Department of History of Medicine, National History and Culturology of I.M. Sechenov First Moscow State Medical University, a cognitive learning model is used mostly for students' independent extracurricular work at the stage of lecture and seminar preparation. Students' preliminary acquaintance with the study theme, its categorical apparatus successfully allows active teaching methods to be applied with the aim of students' personal involvement in the process of searching and selecting principles specific to the historical period being studied, on the basic logic of medicine's development, foreseeing new problems and research issues that arise as a result of various discoveries in medicine, the development of skills to act on the basis of the knowledge gained, taking into account the individual student's experience and depth of understanding of their subject content. In connection with this, the cognitive model for student learning is an essential founding component, without which it is impossible to use in the teaching process operational-activity and individually orientated learning principles.

Operational activity models are built on visible (visual) orientations (schemes), based on which students can accurately operate in solving practical problems. All the information about the order and sequence of discoveries that explain certain patterns of development for theoretical (academic) and practical (clinical practice) aspects of medicine may be schematically presented as part of the history of medicine. As part of the independent work of students should, on the basis of knowledge gained, independently create a scheme and observe the logical connection between theoretical discoveries in the natural sciences (physics, mathematics, chemistry, biology) and the development of anatomy, physiology, clinical and/or experimental medicine. Furthermore, educational interaction in the framework of this model can be built between a teacher and a student or a small group, as well as in a student audience (see. Fig. 1). This method contributes

to an active form of training students through the acquisition of knowledge by building operational links, drawing out of sequences and exchange of views. Students can perform these types of independent work both within the classroom and as extracurricular activities (individually or in a small group). The application of an operational-activity model provides for the history of medicine to be studied via distance learning based on individual (or small groups of) students' work with assignments, including with the use of computer technology and automated forms of control.²⁴

Students must learn to navigate interdisciplinary relationships and to understand the importance of the disciplines included in the curriculum of a particular specialization (medicine, medical-preventive work, dentistry, pediatrics, pharmacy and others). Students' development of the ability to form operational links contributes to the following types of tasks: operationalization of key categories, compiling comparative analytical tables, the solving of situational problems. Furthermore, the principle of consistently formulating task questions using professional language lets us trace the evolution of ideas and facilitates the preparation of students to solve problems, thereby laying the basis for the formation of professional competencies [32].

An individually-based model is aimed at a student's personal growth, his or her motivation for creativity and self-education. The history of medicine course's solution to this problem is to provide tasks, aimed at enhancing the student's ability to set goals and to reflect on and contribute to the professional development of the individual [28]. The leading role in this approach is played by the students themselves, so its use provides for the carrying out of creative works (essay writing, papers, report, work in small groups, participation in meetings of scientific circles and student conferences). At the same time the teacher's task is to create an appropriate learning environment and the psycho-pedagogical conditions for self-development, the foundations of meaningful development of professional medical practice

²⁴ The unified I.M. Sechenov First Moscow State Medical University educational portal.

and the development of the professional awareness of future doctors. Students' willingness to learn (a conscious, mature attitude) and personal interest are the criteria for efficiency models and indicators of students' personal growth [32]. Control tasks can take the form of business exercises and round tables, published abstracts, articles, presentations at regional and international conferences, congresses of young scientists and students, which, of course, is a prerequisite for the formation of an independent researcher in the field of medicine.

Thus, the history of medicine course solves the problem of the development of the methodology for comparing scientific knowledge and the formation of independent clinical thinking, the foundations "of the critical areas of the mind" (Pirogov) [33, p. 18].

Conclusion

The challenge of modern higher education, including health education, is the formation of a higher education system, based on the intellectual leadership of leading Russian scientific schools in various branches of scientific knowledge. Particular attention is given to research activities, the centre of which is an orientation towards modern scientific results. Of great interest in medical science today are related research areas – the natural sciences and information technology, the forming of powerful knowledge-based clusters (neuroscience, biochemistry, bioinformatics, robotics, etc.). Also, the formation of research activity strategies focusing on interdisciplinary areas of research that integrates more disciplines (ethics, evidence-based medicine, nursing, palliative medicine, law, health economics, and others) into the educational process. However, if you mentally step back from the existence of high-tech medical equipment, then you can easily find that medicine today, not only lies within the ethics of Hippocrates, but is also in accordance with its framework in terms of the methodology of knowledge. This underlines the importance of the methodological role of the history of medicine in the educational process, aimed at the formation of ideas about the ontology of clinical disciplines, methods for understanding previous stages of development of specializations and epistemological reserves for future scientific

discoveries. We know many examples of when studying the ideas of predecessors stimulated past doctors' own train of thought: for example, the invention of the stethoscope by Laennec is largely based on a detailed study of examination methods for patients in the medicine of Hippocrates; Galen and his approach to the body as a unity of spiritual and corporal was largely based on Plato's idea of creaturehood of the world, three-part nature of the soul, etc. The times when there was a gradual depreciation of the history of medicine and its transformation into a supplementary field, limited to the study of memorable dates and biographies of famous scientists is behind us. The history of medicine as part of the history of science, easily and organically fits into the structural requirements and techniques for the modern educational process. Intrinsic to the history of medicine course is its interdisciplinary nature, which moves from an analysis of phenomena in the learning process to understanding the basis of medical knowledge's ontological development. Notions of the history of medicine as part of doctors' training, existed in medieval universities when textbooks' content (such as, for example, Articella) included treatises from Hippocrates, Galen and others, which in practice would have been used as teaching aids. Today, the history of medicine course's versatility and its consistency under the conditions of higher medical education restructuring acquires new meaning. Methodological frameworks, based on the study of the historical experience of the older generations, supplemented with one's own experiences and emerged on the basis of skepticism with respect to both prior knowledge and personal experience, should possess an understanding of the need to acquire permanent practical experience and its critical comprehension. The history of medicine as science demonstrates examples of just such an understanding of goal-setting in research and educational teaching activities. As part of its development to ensure a continuity of knowledge, an understanding of methodology and the history of the development of scientific method, as well as dialog between not only teachers and students but also between clinical disciplines and historical epochs.

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