

## TEACHING CLINICAL PHARMACOLOGY AT THE PHARMACEUTICAL DEPARTMENT OF THE Yaroslavl STATE MEDICAL UNIVERSITY


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The main objectives that arise while teaching future chemists currently include formation of knowledge, abilities and skills of pharmacological support of treatment of diseases that enable effective work aimed at implementation of professional tasks and degree of mastery over labor functions. While teaching clinical pharmacology at the pharmaceutical department, we follow the path of an increased scope of new topics on private matters of the discipline including assessment of effectiveness and safety of medicinal preparations taking into account adverse reactions, issues of pharmacoeconomics, pharmacoepidemiology and provisions of evidence-based medicine. In Russian medicine, it is common to adhere to the principle that moral standards are interwoven into clinical practice. This principle is followed during teaching. Proper management of the educational process will enable students to independently work with literature, critically assess new data and continuously improve their professionalism in future.

**Key words:** clinical pharmacology, teaching, evidence-based medicine

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## ПРЕПОДАВАНИЕ КЛИНИЧЕСКОЙ ФАРМАКОЛОГИИ НА ФАРМАЦЕВТИЧЕСКОМ ФАКУЛЬТЕТЕ ЯРОСЛАВСКОГО ГОСУДАРСТВЕННОГО МЕДИЦИНСКОГО УНИВЕРСИТЕТА


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Основные задачи при обучении будущих провизоров в настоящее время — это формирование знаний, умений и навыков фармакологического обеспечения лечения заболеваний, позволяющих осуществлять эффективную работу по реализации задач профессиональной деятельности, и степень овладения трудовыми функциями. Развитие преподавания клинической фармакологии на фармацевтическом факультете идет по пути увеличения объема новых тем по частным вопросам дисциплины, в том числе по оценке эффективности и безопасности лекарств с учетом проявлений нежелательных реакций, а также вопросов фармакоэкономики, фармакоэпидемиологии и положений доказательной медицины. В процессе преподавания дисциплины сохраняется традиционная для российской медицины позиция, что моральные нормы вплетены в клиническую практику. Грамотная организация учебного процесса позволит студентам в дальнейшей их деятельности самостоятельно работать с литературой, уметь критически оценивать новую информацию и непрерывно повышать профессионализм.

**Ключевые слова:** клиническая фармакология, преподавание, доказательная медицина

**Вклад авторов:** С. А. Спешилова — планирование исследования, сбор данных, анализ данных, интерпретация данных, подготовка черновика рукописи, концепция статьи, подбор и анализ литературы, обобщение информации, написание текста; О. А. Синицина — планирование исследования, сбор данных, анализ данных; Е. Г. Лилеева — концепция статьи, подбор и анализ литературы; С. М. Демарина — оформление списка литературы; Ш. Х. Палютин — подбор и анализ литературы, обобщение информации, написание текста.

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The history of department of clinical pharmacology (CP) is associated with creating a course of clinical pharmacology at the department of faculty therapy of the Yaroslavl Medical Institution in 1984 and beginning of teaching at the therapeutic faculty, and at the pharmaceutical faculty as part of pharmacotherapy since 1986. The increasing need in better knowledge of CP among chemists was the reason for occurrence of this discipline at the department in 2005. However, students of the pharmaceutical faculty faced the problem of assimilation of a large amount of knowledge; for this, knowledge of many other disciplines had to be synthesized. Elective course named 'Basis of internal diseases. Pharmacoeconomics' played a remarkable practical role in 2014. It promoted better integration of students into the subsequent educational process at this department.

Subsequently, teaching CP at the pharmaceutical department was accompanied by an increased number of new topics on private issues of the discipline including assessment of effectiveness and safety of drugs considering adverse reactions and issues of pharmacoeconomics, pharmacoepidemiology and provisions of evidence-based medicine [1, 2].

Modern economy of the XXI century requires a presence of highly qualified employees on the labor market. They should have professional competencies. Thus, high requirements were placed on them including chemists [3, 4]. In the presence of a large arsenal of medicinal products (MP), a professional should do as follows:

- 1) analyze the rationality of selection based on criteria of effectiveness and safety of a certain MP in the group of analogous products to treat the basic symptom complexes;

- 2) conduct a pharmaceutical consultation of patients on correct regimen of MP intake, especially regarding novel dosage forms or their combinations;
- 3) provide recommendations on prevention of adverse drug reactions;
- 4) inform physicians of pharmacodynamics, peculiarities of pharmacokinetics, interactions of newly arriving MP, offer a rational alternative to the old MP and those lacking at the time of referral.

A pharmaceutical professional interacting with medical personnel, patients and their relatives, regulatory and oversight bodies should also comply with the rules of medical and pharmaceutical ethics and deontology. A chemist has a moral responsibility for possible negative consequences when MP are created, during clinical trials, manufacture and implementation, quality control of pharmaceutical products and advertising [2, 4].

Presence of a large number of reproduced MP among the registered preparations with unproved effectiveness and safety, a significant difference in the cost of MP with the same international nonproprietary name, excess of doubtful information, and false advertising complicate the chemist's activity. Many issues can be solved using clinical pharmacology [5, 6].

At the Yaroslavl State Medical University, CP is taught to the chemists in accordance with the program composed as per requirements of the Federal State Educational Standard of Higher Education in the specialty of Pharmacy (33.05.01) [2].

CP is taught in the 4<sup>th</sup> and 5<sup>th</sup> years, whereas during the 3<sup>rd</sup> year the students are trained in the abovementioned elective discipline. The current basic tasks achieved during education of future chemists include formation of knowledge, abilities and skills of pharmacological support of treatment of diseases that enable effective work associated with implementation of professional tasks and degree of mastery in labor functions. Highly qualitative medical education can be provided only due to a rational combination of traditional methods of preparation with innovative classic classroom sessions with a wide use of remote technologies, enough time for independent and practical work under the guidance of an experienced mentor [7, 8]. Independent work of pharmaceutical students on rational prescription of drug therapy and drafting a formulary is the basis of practice-oriented training provided at the department. It visually confirms mastering the necessary competencies [9, 10].

Solving clinical issues makes students closer to their future practical activity, promotes deep understanding of the need for theoretical knowledge of CP and makes new data handling possible. This type of education requires attraction of knowledge related to various subjects and enables formation of interdisciplinary connections. This is necessary to master general professional competence [7, 11].

Progressively increased scope of CP-related data assigns serious tasks regarding perfection of the pedagogical process to the teacher as well. The teacher and student nature of interaction has changed when the lessons were organized, and the interactivity became the main method, especially during an attempt to find the best solution by analyzing errors and reviewing actual practical cases. Thus, it is important that a teacher should necessarily be a physician and could show his critical thinking in a proper way [12, 13]. It always attracts great interest among students and evokes an emotional response making the educational process more effective and turning complex issues into more understandable ones.

Moreover, a teacher should make the students interested in the subject, form motivation and stimulate creative thinking using properly asked questions. It is necessary to be always patient about the students' mistakes they make while trying to reach at a conclusion, offer aid or use required sources of information when

the student is not able to find answers independently. Acquisition of certain experience in the process of education is important. Thus, directive rules on practical lessons should be avoided with simultaneous direction of students to the right path [7–9, 14].

In modern education, using tests is a rational and effective addition to other methods of knowledge control. It is widely applied at our department along with online testing. Practical testing enables detection of the level of knowledge, abilities and skills among pharmaceutical students. Tests and joint review of results motivate the students to activate the work on mastering the educational material [7, 14]. Moreover, testing disciplines, organizes and shapes the activity of students.

Oral interrogation is traditionally used at the department as well. It enables to find a correct answer, its consequence, independence of judgements and conclusions, degree of development of logical thinking in a future chemist. This form is used to perform current control of the level of knowledge. It basically concentrates on identification of problem areas in learning, complex issues, phenomena and situations. Collective work of the entire group is definitely used during interrogation as addressing a question to everyone, reviewing the answer and assessing answers of the student or his/her colleagues.

The role of students' cognitive activity, their motivation to independent academic work including the one in electronic educational environment sharply increases [10, 15]. The advantage of the practical approach is that it is organically combined with various modern educational technologies being their integral part.

Unlike many fundamental academic disciplines, clinical pharmacology can't be learned once and for all. Teachers have to get ready for lectures, practical classes on a constant basis updating and analyzing new data [5, 6, 8].

Overall, a chemist should know not just medical and pharmacological disciplines, but also economic and marketing fundamentals, meaning that they should be executed in a qualitative way in accordance with the ethical standards. Today, the Ethical Code of a Russian Pharmacist is in force in Russia [4, 12, 16]. It is based on the Federal Law 'On the Fundamental Healthcare Principles in the Russian Federation', consumer and patient protection legislation, legislation on advertising, Civil Code of the Russian Federation and other legislative acts of Russia, documents of the UN, WHO and other documents related to ethical aspects of pharmaceutical business [2–4]. Employees of the department pay a great attention to the issues of ethics as well. The worldview of students has been shaped during the entire educational period with subsequent improvement of professional skills throughout life. Thus, formation of ethical and deontological culture of future specialists at medical universities is of an exceptional value [15, 16]. A traditional approach stating that ethical standards are build in the clinical practice has been preserved in the process of the discipline teaching.

## CONCLUSION

Formation of the personality of a future chemist at a higher school is a complicated and multi-faceted process success of which is mainly ensured by organization and planning the activity of students, active fulfillment of the educational standard for this specialty, creation of external and internal conditions for intensive development of necessary professional attributes [1, 2, 3]. Proper organization of the educational process will allow students to independently work with literature, being able to assess new information in a critical way and continuously improve their professionalism.

Teaching any academic discipline must result in a qualitative preparation of a graduate by solving the issues while getting education at the university.

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