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## PRACTICAL TRAINING ON “PATHOMORPHOLOGY” AS A WAY TO FORM FUTURE DOCTOR’S PROFESSIONAL COMPETENCE

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**Abstract.** The article presents a practical lesson analysis on the discipline “Pathomorphology” at the Department of Pathological Anatomy as a means of forming future doctor’s professional competence.

The main purpose of practical lesson on “Pathomorphology” is the formation of skills and abilities of pathological processes and diseases of morphological diagnostics by studying morphological pictures with the analysis of pathogenetic mechanisms and clinical symptoms of diseases.

Practical lesson on “Pathomorphology” covers the analysis of incomprehensible and complex issues of the topic during the lecturer and students’ interview, recognition of pathological processes and diseases main manifestations, students’ independent in-class work with macro -, micro -preparations and electron diffraction patterns, solving typical situational clinical tasks with the analysis of mistakes made. The students have the opportunity to observe online autopsies in dissecting room. We created and constantly update archive videos, thematic autopsies.

A multimedia presentation has been developed for each practical lesson topic of the discipline, which contains a practical lesson scenario according to the guidance papers for teachers. This presentation contains the illustrated questions in the form of flowcharts, macro- and micro-preparations, which are proposed to recognise a pathological process or disease.

The main provision of modern education is to provide students with knowledge, skills and abilities that they should master, mainly in independent in-class work, managed and guided by a lecturer. For this stage of practical lesson developed an album with consideration to the peculiarities of teaching the discipline at various faculties. In the album, students draw micro-preparations, according to the scheme; describe macro-preparations, micro-preparations and electron diffraction patterns.

This comprehensive approach to the study of “Pathomorphology” allows discussing divisive interpretations of complex mechanisms of pathological processes development, demonstrating modern research methods in pathological anatomy, as well as better preparing the student for the final controls, the unified state qualification exam and the exam on International fundamentals of medicine.

The students’ educational process in the study of the basic medical discipline “Pathomorphology” is focused on the introduction of new techniques and innovative teaching technologies. In pathological anatomy, a significant place in the assessment of the studied phenomena is given to visual macro-, microscopic, and electron-microscopic analysis of pathology. At the same time, particular importance is attributed to the visibility of the educational process, including with the use of modern multimedia technologies, which is embodied by the teachers of the Department.

Active forms of education, which are used in the practical lessons on “Pathomorphology”, allow students to form basic doctor’s professional competencies. The practical lesson system, which is, used on the Department of Pathological Anatomy makes it possible, first, to motivate the student to study such a complex discipline as “Pathomorphology”. It also ensures the theoretical knowledge acquisition, development and harness skills in the pathological processes and diseases of morphological diagnosis as well as to form personality, which is well versed in the professional field and has competencies for further growth in professional and personal terms.

**Keywords:** practical lesson, professional competence.

**Introduction.** Competence is a dynamic combination of knowledge, skills, practice, mode of thinking, attitudes, values, and other personal qualities that determine a person’s ability to successfully socialise, carry out professional and/or further educational activities (Law of Ukraine “On Education” No. 2145-VIII dated 05.09.2017). In Ukraine there was developed the State

National Programme “Education (Ukraine of XXI century)”, National Doctrine on education development (2002), adopted in 2014 the Law of Ukraine “On Higher Education”, prepared and are on public discussion the draft Concept of education development in Ukraine for 2015-2025 and the draft Strategy of higher education reforming in Ukraine till 2020. All these documents pro-

vide for a radical reform of the educational sector in order to form a creative professional with deep knowledge, strong skills and abilities through “training higher education applicants in modern scientific knowledge using the latest educational and information technologies” [1, 2].

The requirements of the modern labour market stipulate to increase the graduates’ training level, set the task of forming such qualities as the ability to independently formulate tasks and determine ways to solve them within professional competencies, the ability to analyse their professional activities, work with information in a team, establish social binds, continuous self-education, solving professional tasks aimed at improving labour efficiency, and so on. In addition, the future specialist must have a culture of thinking to solve professional problems of a diagnostic nature; he/she should have formed professional interests. To develop these features, it is necessary to equip the future specialist not only with substantive theoretical knowledge, but also with the ability to apply this knowledge in practice. Such forms of higher education organisation as practical lessons [3] facilitate this.

One of the topical issues of modern medical education is the problem of forming the future doctors’ professional competence. New requirements for education dictate the use of new approaches and technologies, among which the most promising are the introduction of technologies and principles of educational process organisation, implementation of new models and content of continuing education based on the extensive use of modern information and communication technologies. The essence of the modern education model is a shift in emphasis from traditional forms of education – memorisation and over learning – to the development of students’ skills and abilities to solve case problems, and not just to accumulate knowledge [3].

The implementation of competence approach should provide for the widespread use of active and interactive forms of training in the educational process (computer simulations, business and role-playing games, study of specific clinical cases and other training) in combination with extracurricular work to form and develop students’ professional skills, that is, base on innovative educational technologies.

**Rationale of the research.** Practical lesson is one of the main forms of in-class training at the University. Practical lesson is a form of training in which the lecturer organises a detailed examination of certain theoretical provisions of the discipline by the students and forms the ability and skills of their practical application by the student individual performance of properly formulated tasks [4].

The main didactic purpose of practical lessons is to form students’ professional skills and practical actions necessary for specialists to perform functional duties and develop professional and business qualities provided by the educational and qualification characteristics of a certain educational level graduate. The main tasks of practical training are:

– intensification and clarifying the knowledge gained in lectures and in the process of independent work;

- development of intellectual skills and planning, analytical and generalisation techniques, mastering the skills of professional activities arrangement;
- accumulation of primary experience in the production setup and management;
- mastering the initial leadership, management and self-management skills [5].

**Goal.** Analysis of practical lesson in the discipline “Pathomorphology” at the Department of Pathological Anatomy as a way to form the future doctor’s professional competence.

**Materials and methods.** Practical lesson is the most important component of teaching the discipline “Pathomorphology”. The main purpose of practical lesson in “Pathomorphology” is to develop skills and abilities of pathological processes and diseases morphological diagnostics by studying morphological patterns, pathogenetic mechanisms and clinical symptoms of diseases. This allows turning the study of the diseases structural base into creative process of knowledge acquiring, and arouses students’ interest in medical science and practice issues.

The discipline work program determines the list of practical lesson topics. Methodical materials for teachers and students have been developed for practical classes, that contain algorithms for practical work performance, as well as tasks and tests to determine the degree of students’ theoretical course mastery, sets of varying difficulty case problems to solve them in the classroom. Practical lesson includes preliminary academic performance, skills and abilities assessment, common issue statement by the lecturer and discussing it, issues solution with their discussion, doing tests, checking them, relevant practical skills mastering and evaluating them.

Plan and organisational structure of practical lesson in “Pathomorphology”:

I. Preparatory stage:

1. Organisational arrangements. Checking the presence of students in class, the timeliness of the completion of missed classes and lectures, re-assessment of unsatisfactory grades. Pay attention to the students’ appearance and adjust it, if necessary (2 minutes).
2. Educational goals set up. Justify the necessary knowledge-skills needed to achieve educational goals. Check the students’ homework accuracy and completeness (3 minutes).
3. Control of the initial level of knowledge. Monitoring of starting knowledge level upon studying the relevant sections of pathological anatomy, as well as independently studied textbook, manuals and lectures materials for the current lesson (15 minutes).

II. Main stage: Students’ independent in-class work supervised by a lecturer.

1. Arrange students’ independent in-class work on the macro-preparations, micro-preparations and electron diffraction patterns study. Draw students’ attention to the specific pathognomonic signs of diseases, which are important for correct macro- and microscopic diagnostics of these diseases. Monitor the accuracy of preparations’ drawings and descriptions in albums (45 minutes).

III. Final stage: 20 minutes.

1. Monitoring and correction of professional skills level (15 minutes).
2. Summing up and announcing the marks (3 minutes).
3. Homework setting and instructions for it completion (2 minutes).

**Results of the research.** Practical lesson on “Pathomorphology” covers the analysis of incomprehensible and complex issues of the topic during the lecturer and students’ interview, recognition of pathological processes and diseases main manifestations, students’ independent in-class work with macro -, micro -preparations and electron diffraction patterns, solving typical situa-

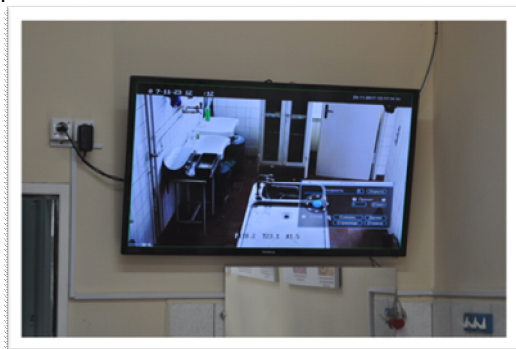
tional of clinical tasks with the analysis of mistakes made.

As is well known, in pathological anatomy, a significant place in the studied phenomena assessment is given to visual macro-, microscopic and electron-microscopic pathology analysis. At the same time, special importance is paid to the educational process visualisation. Museum macro preparations demonstrating general pathological processes and diseases are used to study pathological processes. To recognise microscopic signs that characterise pathological processes, students receive sets of thematic micro-preparations and light-optical microscopes.



**Fig. 1. Macro-preparations and sets of thematic micro-preparations of the Department of Pathological Anatomy of IFNMU.**

Multimedia technologies are also used in the practical lesson. Three classrooms (components of the educational-practical “Pathomorphology” centre) are equipped with TV monitors, whereby the students have the opportunity to observe online autopsies in dissecting room (Fig. 2). At the Department, we created and constantly update archive videos, thematic autopsies that allows displaying them upon studying relevant topic on practical lesson.



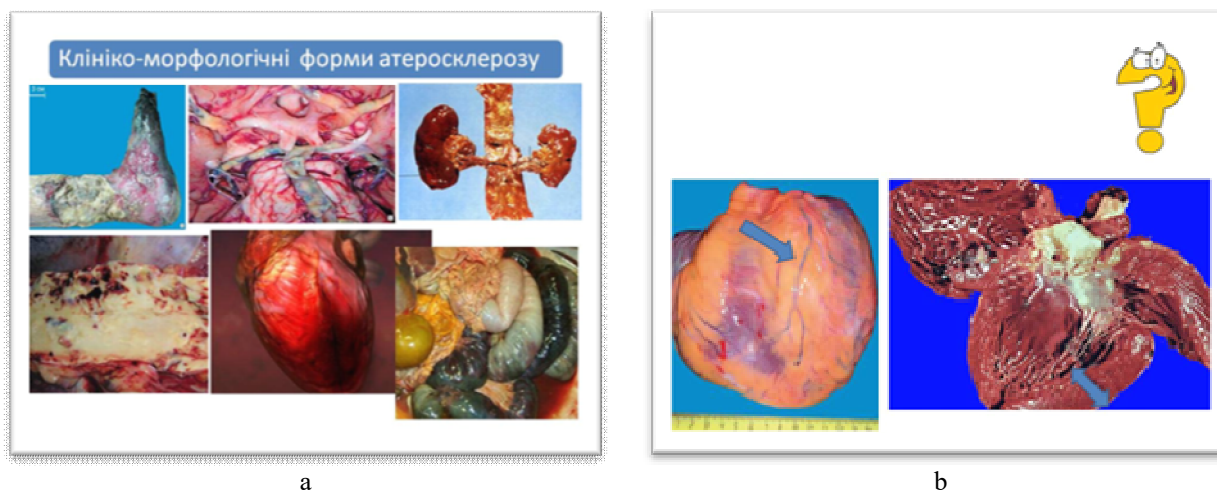
**Fig. 2. The possibility of online observing the autopsy in the dissecting room.**

The Department’s academic staff takes full advantage of the Department’s available capabilities for educational purposes. In addition, a multimedia presentation has been developed for each practical lesson topic of the discipline, which contains a practical lesson

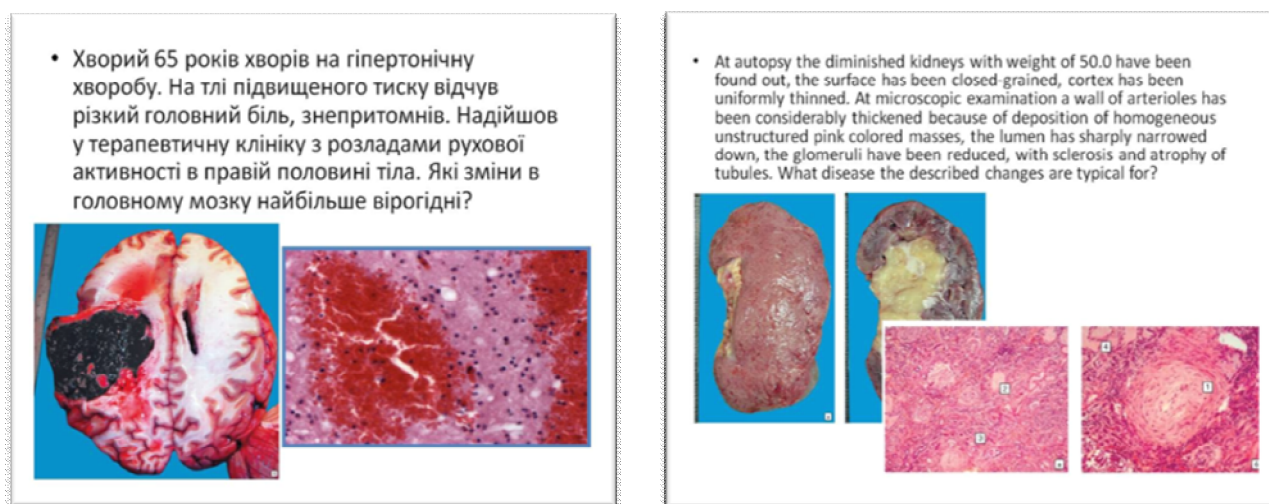
scenario according to the guidance papers for teachers. This presentation contains the illustrated questions in the form of flowcharts, macro- and micro-preparations, which are proposed to recognise a pathological process or disease (Fig. 3 a, b).

One of the criteria of mastering a discipline is the ability to deal with clinical and anatomic challenges, being an effective means of learning that promotes autonomy in decision-making, therefore students are presented clinical cases in the form of situational clinical tasks, which are accompanied by macro - and microscopic pictures (Fig. 4).

The main provision of modern education is to provide students with knowledge, skills and abilities that they should master, mainly in independent in-class work, managed and guided by a lecturer. For this stage of practical lesson, the Department’s lecturers have developed an album with consideration to the peculiarities of teaching the discipline at various faculties. In the album, students draw micro-preparations, according to the scheme; describe macro-preparations, micro-preparations and electron diffraction patterns. The histological specimens presented in the album contain instructions on how to stain with micro preparations and the corresponding keys that the student must make. The album also contains an element of independent extracurricular work, that is, a student should give the written answers to questions.



**Fig. 3. Slides of the practical lesson multimedia presentation on “Cardiovascular system diseases”:** a - specify the clinical and morphological forms of atherosclerosis and their characteristics; b - establish, describe and interpret the heart morphological changes caused by hypertension.



**Fig. 4. Slides of the practical lesson of multimedia presentation on “Cardiovascular system diseases”:** clinical cases study and case problem solution: a - in Ukrainian, b - in English.

The Department has developed a description pattern of organs and tissues structural changes upon various nosology aimed at the consistent development of skills and morphological diagnostics of pathological processes. Students' independent in-class work with macro- and micro-preparations is constantly monitored by the lecturer and adjusted, if necessary.

The lecturer checks albums with the macro-preparations descriptions, micro-preparations and electron diffraction patterns sketches and descriptions, signs the albums and makes assessment, which is one of the criteria for evaluating the student's knowledge in the practical lesson.

Criteria for evaluating students' knowledge in a practical lesson are as follows:

Oral survey: 2 grade points – the student's oral answer met the higher school requirements (the topic is fully covered, the answer was logical, evidence-based: examples were used, the student answered additional questions on this topic); 1 grade point – the student's oral

answer was correct and complete enough, the student could not answer additional questions; 0 grade points – the student lacked of knowledge of the material or mastered it fragmentarily.

Macro-preparations description: 1 grade point – the student fully described the macro-preparation according to the scheme approved by the curriculum and answered on the additional questions; 0 grade points – the student fragmentarily described the macro-preparation and did not answer on the additional questions.

Micro-preparations description: 1 grade point – the student fully described and sketched the micro-preparation according to the scheme approved by the curriculum, indicated the pathological processes under study and answered on the additional questions; 0 grade points – the student fragmentarily described and schematically sketched the micro-preparation, but did not indicate the pathological processes under study and did not answer on the additional questions.

Test check: 2 grade points – 85-100%; 1 grade point – 51-84%; 0 grade points – up to 50%.

Case problems: 2 grade points – the student fully and logically answered on the questions and solved the case problems; 1 grade point – the student fully and logically answered on the questions or solved the case problems; 0 grade points – did not answer the questions and did not solve the case problems.

This comprehensive approach to the study of “Pathomorphology” allows to discuss the divisive interpretations of complex mechanisms of pathological processes development and to give full details of the pathological anatomy key issues: study of the morphological substrate of human diseases at different research levels, demonstrate modern research methods in pathological anatomy, as well as better prepare the student for the final modular controls, the unified state qualification exam and the exam on International fundamentals of medicine (IFOM).

**Conclusions.** The students’ educational process in the study of the basic medical discipline “Pathomorphology” is focused on the introduction of new methods and innovative learning techniques. Active forms of education used in the practical lesson “Pathomorphology”, allow students to develop the doctor’s basic professional competence. The practical lesson system used at the Department of Pathological Anatomy makes it possible, first of all, to motivate the student to study such a complex discipline as “Pathomorphology”, to ensure the theoretical knowledge acquisition, development and harness skills in the pathological processes and diseases morphological diagnosis as well as to form personality, which is well-versed in the professional field and has competencies for further growth in professional and personal terms.

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### ПРАКТИЧЕСКОЕ ЗАНЯТИЕ ПО «ПАТОМОРФОЛОГИИ» КАК СПОСОБ ФОРМИРОВАНИЯ ПРОФЕССИОНАЛЬНОЙ КОМПЕТЕНТНОСТИ БУДУЩЕГО ВРАЧА

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**Резюме.** В статье изложен анализ практического занятия по дисциплине «Патоморфология» на кафедре патологической анатомии как средства формирования профессиональной компетентности будущего врача.

Основной целью практических занятий по «Патоморфологии» является формирование умений и навыков морфологической диагностики патологических процессов и болезней путем изучения морфологических картин с анализом патогенетических механизмов и клинических симптомов заболеваний.

Образовательный процесс студента при изучении базовой медицинской дисциплины «Патоморфология» ориентирован на внедрение новых методик и инновационных технологий обучения.

В патологической анатомии значительное место в оценке исследуемых явлений уделяется визуальному макро-, микроскопическому и электронно-микроскопическому анализу патологии. При этом особое значение придается наглядности образовательного процесса, в том числе с применением современных мультимедийных технологий, что внедряется профессорско-преподавательским составом кафедры.

Активные формы обучения, используемые на практическом занятии по «Патоморфологии», позволяют сформировать у студентов базовую профессиональную компетентность врача. Система проведения практического занятия, которая используется на кафедре патологической анатомии, позволяет, в первую очередь, мотивировать студента к изучению такой сложной дисциплины как «Патоморфология», обеспечить усвоение теоретических знаний, приобретение и применение практических навыков и умений по морфологической диагностике патологических процессов и заболеваний, формировать личность, которая ориентируется в профессиональной сфере и обладает деловыми качествами и глубокими знаниями для

дальшого росту в професійному і особистості-ном плані.

**Ключевые слова:** практичне заняття, професійна компетентність.

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**ПРАКТИЧНЕ ЗАНЯТТЯ З  
«ПАТОМОРФОЛОГІЇ» ЯК ЗАСІБ  
ФОРМУВАННЯ ПРОФЕСІЙНОЇ  
КОМПЕТЕНТНОСТІ МАЙБУТНЬОГО ЛІКАРЯ**

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**Резюме.** В статті викладений аналіз практичного заняття з дисципліни «Патоморфологія» на кафедрі патологічної анатомії як засобу формування професійної компетентності майбутнього лікаря.

Основною метою практичних занять з «Патоморфології» є формування умінь і навичок морфологічної діагностики патологічних процесів та хвороб шляхом вивчення морфологічних картин з аналізом патогенетичних механізмів і клінічних симптомів захворювань. Освітній процес студента при вивченні базової медичної дисципліни «Патоморфологія» орієнтований на впровадження нових методик та інноваційних технологій навчання.

У патологічній анатомії значне місце в оцінці досліджуваних явищ приділяється візуальному макро-, мікроскопічному і електронно-мікроскопічному аналізу патології. При цьому особливе значення надається унаочненню освітнього процесу, зокрема із застосуванням сучасних мультимедійних технологій, що втілюється професорсько-викладацьким складом кафедри.

Активні форми навчання, що використовуються на практичному занятті з «Патоморфології», дозволяють сформувати у студентів базові професійні компетентності лікаря. Система проведення практичного заняття, що використовується на кафедрі патологічної анатомії, дозволяє насамперед зацікавити студента вивченням такої складної дисципліни як «Патоморфологія», забезпечити засвоєння теоретичних знань, придбання і застосування практичних навичок і умінь по морфологічній діагностиці патологічних процесів та захворювань, формувати особистість, яка орієнтується в професійній сфері і володіє компетенціями для подальшого зростання в професійному та особистісному плані.

**Ключові слова:** практичне заняття, професійна компетентність.

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