MINISTRY OF HEALTHCARE OF UKRAINE
KHARKIV NATIONAL MEDICAL UNIVERSITY

Department of Internal Medicine № 3 and Endocrinology
Academic year 2021-2022

SYLLABUS OF THE EDUCATIONAL COMPONENT
«Modern methods of diagnosis in cardiology»

Normative educational component

The form of education is full-time

Area of knowledge "22" Health care
Specialty "222" Internal medicine
Specialization (if available) _____
Educational and professional program of the second (master's) level of higher education
Course V

The syllabus of the discipline was considered at the meeting of the Department of Internal Medicine № 3 and Endocrinology

Protocol from
"30" August 2021 № 14

Head of Department
_____ prof. L.V. Zhuravlyova
(signature) (initials, surname)

Approved by the methodical commission of KhNMU on problems of therapeutic profile

Protocol from
"31" August 2021 № 1

Head
_____ prof. P.G.Kravchun
(signature) (initials, surname)

Kharkiv – 2021

COMPILERS OF THE SYLLABUS:

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INFORMATION ABOUT LECTURERS, WHO ARE TEACHING THE EDUCATIONAL COMPONENT

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consultations 8.00-15.00 http://distance.knmu.edu.ua/course/view.php?id=862.

Location: classrooms of the Department of Internal Medicine №3 and endocrinology on the basis of Kharkiv Regional Clinical Hospital (Kharkiv, Independence Ave, 13).

Website of the department: http://vnmed3.kharkiv.ua/.
Class schedule: Monday, Tuesday, Wednesday, Thursday, Friday (8.45-12.20 - first shift and 12.25-15.50 - second shift, according to the schedule).
Location: classrooms of the Department of Internal Medicine №3 and endocrinology on the basis of Regional Clinical Hospital (Kharkiv, Independence Ave. 13).

INTRODUCTION

The syllabus of the discipline "Modern methods of diagnosis in cardiology" is

compiled in accordance with the Standard of Higher Education of Ukraine (hereinafter - Standard), the second (master's) level, realm of knowledge 22 "Health care".

Description of the discipline (abstract).
According to the curriculum, the training of doctors at the educational and qualification level "Master" of the discipline "Modern methods of diagnosis in cardiology" is carried out in the V year (9^{th} semester).
The discipline is structured into five sections:
1. Electrocardiography.
2. Echocardiography.
3. Coronary angiography.
4. Diagnosis of the most common cardiovascular diseases.
Types of classes according to the curriculum are:
a) practical classes;
b) independent work of students;
The subject of study of "Modern methods of diagnosis in cardiology" as a discipline is the study by students of cardiology, internal medicine, as well as other basic disciplines (medical biology, medical and biological physics, bioorganic and biological chemistry, histology, cytology, human anatomy, pathomorphology, physiology and pathophysiology, microbiology, virology and immunology, radiology) and integrates with these disciplines. It lays the foundations for students to acquire advanced knowledge of cardiology, as well as develops the ability to apply knowledge of pathology of internal organs in the process of further training and professional activity in accordance with the principles of evidence-based medicine.
Interdisciplinary connections
"Modern methods of diagnosis in cardiology" as an academic discipline: a) is based directly on the study by students of cardiology, internal medicine, as well as other basic disciplines (medical biology, medical and biological physics, bioorganic and biological chemistry, histology and embryology, human anatomy, pathomorphology, physiology and pathophysiology, microbiology, virology and immunology, radiology) and integrates with these disciplines;
b) lays the foundation for students to acquire advanced knowledge of cardiology;
c) forms the ability to apply knowledge of pathology of internal organs in the process of further training and professional activity in accordance with the principles of evidence-based medicine.
Prerequisites and co-requisites of the discipline. Anatomy, physiology, histology, pathological anatomy, pathological physiology, internal diseases; clinical pharmacology, surgery.

Page in Moodle: http://distance.knmu.edu.ua/course/view.php?id=3988

1. PURPOSE AND TASKS OF THE COURSE

1.1. The purpose and objectives of the discipline. The purpose of teaching the course "Modern methods of diagnosis in cardiology" is to acquire and deepen the knowledge, skills, abilities and other competencies in cardiology required

in professional activities, which are established on the basis of educational and professional program.

1.2. The main objectives of the course "Modern methods of diagnosis in cardiology" include the acquisition of competencies by students in accordance with the general and professional competencies of the educational-professional program "Medicine" of the second (master's) level of higher education in 222 Medicine, qualification master of medicine: determining the necessary list of laboratory and instrumental studies and evaluation of their results, establishing a preliminary and clinical diagnosis of the disease, diagnosing emergencies and providing emergency medical care, keeping medical records, the ability to apply knowledge in practical situations, understanding the subject area and professional activities, the ability to adapt and act in a new situation, making an informed decision, the ability to work in a team, act socially responsibly and consciously.

1.3. Competences and learning outcomes, the formation of which is facilitated by the discipline.

1.3.1. The study of the discipline provides students with the acquisition of **competencies:**

integral: ability to solve typical and complex specialized tasks and practical problems in professional activities in the field of health care, or in the learning process, which involves research and / or innovation and is characterized by complexity and uncertainty of conditions and requirements;

general:

- ability to apply knowledge in practical situations;
-knowledge and understanding of the subject area and understanding of the profession;
- ability to exercise self-regulation and maintain a healthy lifestyle;
- ability to adapt and act in a new situation;
- ability to choose a communication strategy;
- ability to work in a team;
- interpersonal skills;
- ability to communicate in English language both orally and written;
- skills of using information and communication technologies;
- ability to think, analyze and synthesize;
- ability to learn and be modernly trained;
- ability to apply knowledge in practical situations;
- ability to evaluate and ensure the quality of work performed;
- determination and persistence in terms of tasks and responsibilities;
- ability to act socially responsibly and consciously.

special (professional):

-ability to establish a preliminary clinical diagnosis of the disease;
- ability to evaluate the results of laboratory and instrumental studies;
- ability to diagnose emergencies;
- skills of performing of diagnostic medical manipulations;

- ability to keep medical records;
- ability to process state, social, economic and medical information;
-ability to take measures to improve the efficiency of resource use;
- ability to market diagnostic medical services.

1.3.2. The study of the discipline provides students with the acquisition of the following program learning outcomes (PLO):

PLO 1. To formulate a preliminary diagnosis of the most common diseases of the cardiovascular system

PLO 2. To make a plan for examination of the patient and analyze the data of laboratory and instrumental examinations for the most common diseases of cardiovascular system and their complications

PLO 3. To perform a differential diagnosis, substantiate and formulate a clinical diagnosis of the most common diseases of cardiovascular system

PLO 4. To diagnose and provide medical care in emergencies

PLO 5. To perform diagnostic manipulations

PLO 6. To keep medical records, process governmental, social and medical information.

1.3.3. The study of the discipline provides students with the following social skills (Soft skills): stress resistance, the ability to adapt to the situation, sociability, the ability to work in a team, the desire to learn, critical thinking, and the ability to plan.

2. INFORMATION SCOPE OF THE COURSE

Name of indicators	Field of knowledge, direction of training, educational and qualification level	Characteristics of the discipline	
		full-time form of study	**evening form of study**
Number of credits – 3	Realm of knowledge 22 "Health care"	Normative (optional)	
The total number of hours - 90.	Specialty "222" Internal medicine	**Year of preparation:**	
		5th	--
		Semester	
		9th	--
		Lectures	
Hours for day (or evening) form of study: classrooms - 20 independent work of the student - 70	Education and qualification level: The second (master's) level	-	--
		Practical, seminar	
		20 hours	--
		Laboratory	
		-	-
		Individual work	
		70 hours	--
		Individual tasks: hours.	
		Type of control: differential test	

2.1. Description of the discipline

2.2.1 Lectures

№	Name of the topic	Number of hours	Type of lecture
1.			
	Total hours		

2.2.2 Seminars

№	Name of the topic	Number of hours	Method of teaching	Forms of control
1				
	Total hours			

2.2.3 Practical classes

№	Name of the topic	Number of hours	Method of teaching	Forms of control
1	Electrocardiography: definition, how to read an ECG, evaluation of waves, segments, intervals and complexes,	5	Presentations, videos, guidelines for teachers and students for full-time and distance learning	Current control (oral questioning, testing)

	documenting of ECG results			
2	Echocardiography: definition, basic principles, indications, types of echocardiographic studies, echocardiography for the most common cardiovascular diseases	5	Presentations, videos, guidelines for teachers and students for full-time and distance learning	Current control (oral questioning, testing)
3	Coronary angiography: definition, description of the procedure, indications, contraindications, technique, classification of coronary lesions, balloon angioplasty and stent implanting, complications	5	Presentations, videos, guidelines for teachers and students for full-time and distance learning	Current control (oral questioning, testing)
4	Test for the control of obtained knowledge	5	Presentations, videos, guidelines for teachers and students for full-time and distance learning	Current control (oral questioning, testing)
	Total hours	20		

2.2.4. Laboratory classes.

№	Name of the topic	Number of hours	Method of teaching	Forms of control
1				
	Total hours			

2.2.5. Individual work

№	Name of the topic	Number of hours	Method of teaching	Forms of control
1	Diagnosis of the chronic forms of ischemic heart disease (angina, painless forms of ischemia, diffuse cardiosclerosis)	5	Presentations, videos, guidelines for teachers and students for full-time and distance learning	Current control (oral questioning, testing)

2	Diagnosis of the acute forms of ischemic heart disease (myocardial infarction, unstable angina)	5	Presentations, videos, guidelines for teachers and students for full-time and distance learning	Current control (oral questioning, testing)
3	Diagnosis of arterial hypertension	5	Presentations, videos, guidelines for teachers and students for full-time and distance learning	Current control (oral questioning, testing)
4	Diagnosis of acquired heart defects	5	Presentations, videos, guidelines for teachers and students for full-time and distance learning	Current control (oral questioning, testing)
5	Diagnosis of congenital heart disease	5	Presentations, videos, guidelines for teachers and students for full-time and distance learning	Current control (oral questioning, testing)
6	Diagnosis of pericarditis	5	Presentations, videos, guidelines for teachers and students for full-time and distance learning	Current control (oral questioning, testing)
7	Diagnosis of infectious endocarditis	5	Presentations, videos, guidelines for teachers and students for full-time and distance learning	Current control (oral questioning, testing)
8	Diagnosis of cardiomyopathies	5	Presentations, videos, guidelines for teachers and students for full-time and distance learning	Current control (oral questioning, testing)
9	Diagnosis of myocarditis	5	Presentations, videos, guidelines for teachers and students for full-time and distance learning	Current control (oral questioning, testing)
10	Diagnosis of chronic heart failure	5	Presentations, videos, guidelines for teachers and students for full-	Current control (oral questioning, testing)

			time and distance learning	
11	Diagnosis of acute heart failure	5	Presentations, videos, guidelines for teachers and students for full-time and distance learning	Current control (oral questioning, testing)
12	Diagnosis of various types of arrhythmias	5	Presentations, videos, guidelines for teachers and students for full-time and distance learning	Current control (oral questioning, testing)
13	Diagnosis of dissecting aortic aneurysm	5	Presentations, videos, guidelines for teachers and students for full-time and distance learning	Current control (oral questioning, testing)
14	Diagnosis of pulmonary embolism	5	Presentations, videos, guidelines for teachers and students for full-time and distance learning	Current control (oral questioning, testing)
	Total hours	70		

3.EVALUATION POLICY

3.1. The evaluation of educational success of students is performed on the basis of the current "Instructions for evaluating the educational activities of students of KhNMU".

It is recommended to conduct practical classes with the inclusion of:

1) control of the initial level of knowledge with the help of tests made in the format of a question with 5 answer options, 1 of which is correct;

2) questioning of students on the topic of the lesson;

3) management of 1-2 patients with diseases and conditions corresponding to the subject of the lesson, followed by discussion of diagnosis, differential diagnosis with the use of principles of evidence-based medicine and in accordance with National and European guidelines and protocols;

4) consideration of the results of additional research methods (laboratory and instrumental), which are used in the diagnosis and differential diagnosis, according to the topic of the class;

5) control of the final level of knowledge using multiple choice questions and case-based questions.

Mastering of the topic (current control) is controlled in a practical lesson in accordance with specific goals, mastering of semantic sections - in practical final lessons. It is recommended to use the following tools to assess the level of

preparation of students: computer tests, case-based questions, evaluation of laboratory tests, including interpretation of their results, analysis and evaluation of instrumental tests results, evaluation of parameters that characterize the functions of the human body, control of practical skills.

Current control (CC) is performed by the lecturer of the academic group at the last lesson. Mastering of the topic (current control) is controlled in a practical lesson in accordance with specific goals. The following tools are used to assess the level of preparation of students: computer tests, case-based questions, interpretation and evaluation of laboratory tests, analysis and evaluation of instrumental studies and parameters that characterize the functions of the human body, control of practical skills. The final test (FT) must be conducted in accordance with the curriculum during the semester on a schedule, in a class. Work off of missed classes is performed by the lecturer of the academic group. Grade assessment is performed according to the traditional 4-point system: "excellent", "good", "satisfactory" and "unsatisfactory". The conversion of the average grade for current educational activities into a multi-point scale is performed in accordance with the "Instructions for the assessment of the educational activities of students…" or taking into considerstion the average grade calculated in electronic journal. The minimum number of points a student must obtain for the current activity during the study of the section is 70 points, the maximum number of points - 120.

Assessment of individual work of students. Individual work of students, which is provided by the topic of the lesson along with classroom work, is assessed during the current control of the topic in the relevant lesson.

Assessment of individual student tasks is performed under the conditions of the teacher's tasks (report of the abstract in a practical lesson, report with a presentation in a practical lesson, report at scientific and practical conferences of the department or university, writing abstracts, articles, participation in the All-Ukrainian competitions). Points (up to 10) are added as incentives. The total amount of points for current educational activities must not exceed 120 points.

Organization of final test. Admission to the final test is determined in points of current educational activity, namely: min - 70, max - 120 points. Final test is performed by the lecturer of the academic group. If the test is not passed, the dates of rescheduling are set and test should be passed until the beginning of the next semester. Final test results are assessed as "worked out", "not worked out".

Performing of the final test:

1. Passing of 20 multiple-choice questions and 20 case-based questions in the course section on Moodle platform. Evaluation criterion - 95-100% of correct answers, "passed - failed".
2. Assessment of practical skills acquisition (assessment criteria - "performed" or "failed").
3. Assessment of theoretical knowledge is done according to the question cards, which contain three theoretical questions from the sections of the discipline. The criteria for assessing theoretical knowledge can be seen in a table:

Assessment of theoretical knowledge

Number of quest	«5»	«4»	«3»	Oral answer for tickets, which include the theoretical part of the discipline	For each answer student receives 10 to 16 points, which corresponds to: «5» - 16 points; «4» - 13 points; «3» - 10 points.
1	16	13	10		
2	16	13	10		
3	16	13	10		
	48	39	30		

Grading of the course.

Grading of the course is done according to the student's activities in class and in appropriate section in Moodle. The range of points, possible to obtain for the course is between 70 and 120. Final test is done both in class orally and also includes multiple choice questions and case based questions at Moodle platform. Final test results are assessed as "worked out", "not worked out".

Upon completion of the course, the person responsible for the organization of educational and methodical work at the department or the lecturer puts the proper number of points and the corresponding note in the student's record book and also fills in the student's academic progress list on the discipline form Y-5.03B - **undifferentiated test**.

Note "**not worked out**" is written to students who were admitted to the undifferentiated test, but did not pass it and those, who were not admitted to the test.

The list of questions for final test

- Definition of ECG, basic electrophysiology of the heart, characteristics of the normal ECG.
- How to read an ECG, ECG calculation of the heart rate in adults, determining rhythm on ECG stripe, cardiac axis determination.
- Evaluation of the PR interval, QRS complexes, ST segment, T waves, evaluation of the P wave morphology.
- Signs of right and left ventricular hypertrophy on ECG.
- Description of ECG results, documenting the ECG results in the notes.
- Definition and basic principles of echocardiography. Physical principles of ultrasound. Types of echocardiographic studies. Technique of echocardiography.
- Basic Transthoracic Echocardiography. Description of transthoracic echocardiography procedure. Indications for echocardiography.
- Echocardiography for ischemic heart disease.
- Echocardiography for arterial hypertension.
- Echocardiography for valvular heart disease.
- Echocardiography for congenital heart defects.
- Echocardiography for pulmonary hypertension.
- Echocardiography for infective endocarditis.
- Echocardiography for cardiomyopathies.
- Echocardiography for pericardial diseases.
- Definition of coronary angiography, description of coronary angiography procedure. Definition of percutaneous coronary intervention (PCI). Anatomy and physiology of

coronary vessels. Indications for coronary angiography and percutaneous coronary intervention.

- Contraindications to percutaneous coronary intervention.
- Coronary artery angioplasty (radial access).
- Technique of percutaneous coronary intervention.
- Coronary stenosis classification. ACC/AHA classification of coronary lesions.
- TIMI myocardial perfusion (TMP) grade.
- Balloon Angioplasty and Stent implanting.
- Complications of PCI
- Modern diagnostic methods of the chronic forms of ischemic heart disease (angina, painless forms of ischemia, diffuse cardiosclerosis).
- Modern diagnostic methods of the acute forms of ischemic heart disease (myocardial infarction, unstable angina).
- Modern diagnostic methods of arterial hypertension.
- Modern diagnostic methods of the valvular heart disease.
- Modern diagnostic methods of congenital heart defects.
- Modern diagnostic methods of cardiomyopathies.
- Modern diagnostic methods of pericardial diseases.
- Modern diagnostic methods of myocarditis.
- Modern diagnostic methods of infectious endocarditis.
- Modern diagnostic methods of acute and chronic heart failure.
- Modern diagnostic methods of various types of arrhythmias.
- Modern diagnostic methods of dissecting aortic aneurysm.
- Modern diagnostic methods of pulmonary embolism.

4. DISCIPLINE POLICY

To achieve the goals of training and to complete the course successfully, it is necessary to join the work from the first day; attend lectures regularly; read the material before its consideration in a practical lesson; not to be late and not to miss classes; come to the department dressed in a medical uniform, have medical shoes, stethoscope, notebook, pen; perform all necessary tasks and work on everyday basis; be able to interact with a partner or work in a group; ask for help and get it when you need it.

Academic mobility and interchangeability of credits (volume of 1 credit corresponds to 30 hours) is provided. Students can discuss different tasks, but should perform them individually. Students are prohibited to cheat, use any kind of software, tips, mobile phones, tablets or other electronic gadgets during the lesson. Students are not allowed to be late at practical classes. Missed practical classes are worked of hour by hour to the group lecturer or to the duty teacher. Work offs and consultations are held daily from 15.00 to 17.00, also on Saturdays in accordance with the "Regulations on the work off procedures for students" from 07.12.2015 № 415.

Students with special needs should meet with the lecturer or warn him before the start of classes; it can be also done by the group monitor at the request of the

student. If you have any questions, please contact the lecturer.

5. ACADEMIC INTEGRITY

At the Department of Internal Medicine № 3 and Endocrinology, an adherence to academic integrity as a mandatory component of the internal quality assurance system of the educational program is necessary. Observance of academic integrity takes place according to the current legislation:

• Order №305 of 27.08.19 on the organization of the educational process in KhNMU.
• Code of Academic Integrity of KhNMU.
• Order № 165 of 02.07.2020 on measures to develop the system of academic integrity in KhNMU.
• Regulations on academic integrity.
• Regulations on the Commission for Academic Integrity, Ethics and Conflict Management of KhNMU.
• Recommendations of the National Agency for Quality Assurance in Higher Education.
• Law of Ukraine "On Education", Article 42.

6. RECOMMENDED LITERATURE

1. Manual of cardiac diagnosis 1st edition. Mark Anderson, Donald Heistad, Richard E. Kerber. Jaypee Brothes Medical Publishers. – 2014. – 890 pages.
   Cardiology consult manual. Mieszczanska, Hanna Z., Budzikowski, Adam S. Springer. - 2018. – 450 pages.
2. MSD Manual. Professional version. Cardiovascular disorders. https://www.msdmanuals.com/professional/cardiovascular-disorders. Assessed Aug., 2021.
3. Davidson's Principles and Practice of Medicine23rd Edition. Editors: Stuart Ralston, Ian Penman, Mark Strachan Richard Hobson. Elsevier. - 2018. – 1440p.
4. USMLE Step 2 CK Lecture Notes 2017: Internal Medicine (Kaplan Test Prep). - 2016. - Published by Kaplan Medical. - 474 pages.
5. Current diagnosis and treatment in Cardiology. 5th edition. Michael Crawford. McGraw-Hill Education – 2017. – 640 pages.
6. Braunwald's heart disease: a textbook of cardiovascular medicine. 10th edition. Douglas Mann , Douglas Zipes , Peter Libby , Robert Bonow. Elsevier. – 2014. - 2040 pages.
7. Manual of Cardiovascular Medicine. Brian P. Griffin. Lippincott Williams and Wilkins. – 2018. – 1172 pages.
8. The ESC Textbook of Cardiovascular Medicine. John Camm, Thomas F. Luscher, Gerald Maurer. Oxford University Press. – 2019. – 3408 pages.
9. Advanced imaging in the diagnosis of cardiovascular diseases: the "ongoing" future. Luca Saba. Cardiovasc Diagn Ther. 2020 Aug; 10(4): 915–918.
10. Arbab-Zadeh A, Fuster V. From Detecting the Vulnerable Plaque to Managing the Vulnerable Patient: JACC State-of-the-Art Review. *J Am Coll Cardiol* 2019;74:1582-93. 10.1016/j.jacc.2019.07.062

11. Töger J, Zahr MJ, Aristokleous N, et al. Blood flow imaging by optimal matching of computational fluid dynamics to 4D-flow data. *Magn Reson Med* 2020;84:2231-45. 10.1002/mrm.28269
12. Mason JW, Hancock EW, Gettes LS. Recommendations for the standardization and interpretation of the electrocardiogram: part II: electrocardiography diagnostic statement list a scientific statement from the American Heart Association Electrocardiography and Arrhythmias Committee, Council on Clinical Cardiology; the American College of Cardiology Foundation; and the Heart Rhythm Society Endorsed by the International Society for Computerized Electrocardiology. J Am Coll Cardiol 2007; 49: 1128-1135.
13. Schijvenaars BJ, van Herpen G, Kors JA. Intraindividual variability in electrocardiograms. J Electrocardiol 2008; 41: 190-196.
14. Hamdan A, Zafrin N. Modalities to assess myocardial viability in the modern cardiology era. Coron Artery Dis 2006; 17: 567-576.
15. Gilard M, Zeller M. Reliability and limitations of angiography in the diagnosis of coronary plaque rupture: an intravascular ultrasound study. Arch Cardiovasc Dis 2008; 101: 114-120.
16. Avi V, Sugeng L. Three-dimensional adult echocardiography: where the hidden dimension helps. Curr Cardiol Rep 2008; 10: 218-225.

7. INFORMATION RESOURSES

1. https://www.news-medical.net/health/Cardiovascular-Disease-Diagnosis.aspx
2. http://groups.csail.mit.edu/medg/ftp/wjl/aim97/aimj-96.pdf
3. http://www.cdc.gov/heartdisease/docs/consumered_heartdisease.pdf
4. http://www.who.int/cardiovascular_diseases/en/cvd_atlas_01_types.pdf
5. www.nhlbi.nih.gov/.../living_hd_fs.pdf
6. https://www.escardio.org/Guidelines/Clinical-Practice-Guidelines
7. http://mtd.dec.gov.ua/index.php/uk/
8. https://www.nice.org.uk
9. http://www.oxfordmedicaleducation.com/
10. http://professional.heart.org/professional/GuidelinesStatements/UCM_316885_Guidelines-Statements.jsp
11. https://www.mayoclinic.org/diseases-conditions/heart-disease/diagnosis-treatment/drc-20353124
12. https://www.temeculavalleyhospital.com/services/heart-and-vascular/cardiology/advanced-cardiac-diagnostics
13. https://www.iaea.org/topics/cardiovascular-diseases

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