

MINISTRY OF HEALTH OF UKRAINE  
KHARKIV NATIONAL MEDICAL UNIVERSITY  
Department of Internal Medicine № 2, Clinical Immunology and Allergology  
named after academician L.T.Malaya  
2021-2022 Academic year

**SYLLABUS OF THE EDUCATIONAL DISCIPLINE**  
**«Functional Diagnostics in internal medicine»**

Selective course  
Full-time education

Area of knowledge 22 "Health Care"  
Specialty 222 "Medicine"

Educational-professional program Medicine of the second (master's) level  
of higher education  
**for 6th year students**

Syllabus approved at the meeting  
Department of Internal Medicine No. 2,  
Clinical Immunology and Allergology  
named after academician L.T. Malaya

Protocol  
“ 28 ” august 2020 year № 23

Head of the Department

  
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Professor Kravchun P.G.

Syllabus approved at the meeting  
Methodical Commission of KNMU on  
problems of therapeutic profile

Protocol  
“ 31 ” august 2020 year № 1

Chairman

  
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Professor Kravchun P.G.

## **SYLLABUS DEVELOPERS**

1. Kravchun P.G., Head of the Department of Internal Medicine No2, Clinical Immunology and Allergology named after Academician L.T.Malaya, Professor, Doctor of Medical Sciences

2. Borzova O.Y., Associate Professor of the Department of Internal Medicine No2, Clinical Immunology and Allergology named after Academician L.T.Malaya, Associate Professor, Candidate of Medical Sciences

3. Rynchak P.I., Associate Professor of the Department of Internal Medicine No2, Clinical Immunology and Allergology named after Academician L.T.Malaya, Associate Professor, Candidate of Medical Sciences

## INFORMATION ABOUT TEACHERS

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Information about consultations: Full-time consultations: schedule and location according to the schedule of the department.

On-line consultations: should be arranged in advance with the teacher.

Location: auditorium and classrooms of the Department of Internal Medicine №2, Clinical Immunology and Allergology named after academician L.T. Malaya based on CNE "City Clinical Hospital №27" of KhMR (Pushkinskaya Street, 41).

Opening hours: Monday, Tuesday, Wednesday, Thursday, Friday according to the schedule.

## INTRODUCTION

### **Description of the discipline**

The elective course "**Functional Diagnostics in Internal Medicine**" for 6th year students involves students studying the basic issues of functional diagnostics in internal medicine with an emphasis on acquiring skills in diagnosing diseases using methods of functional diagnostics of internal organs in a therapeutic clinic.

Functional diagnostics is one of the necessary discipline in the training of physicians of any profile who study diagnostic patterns and features of pathogenesis, structural and functional changes in diseases of internal organs and connective tissue using an interdisciplinary approach to their diagnosis.

### **Prerequisites and co-requisites of the discipline**

Prerequisites of the elective course "Functional diagnostics in internal medicine": human anatomy, medical and biological physics, pathomorphology, pathophysiology, propaedeutics of internal medicine.

Co-requisites of the discipline of the elective discipline "Functional diagnostics in internal medicine": internal medicine.

**The page of the Discipline in the system Moodle** - department of internal medicine №2, clinical immunology and allergology named after academician L.T. Malaya

## 1. PURPOSE AND TASKS OF THE COURSE

**1.1. The purpose** of studying the elective discipline "**Functional diagnostics in internal medicine**" for 6th year students is to acquire and deepen knowledge, skills, abilities and other competencies in functional diagnostics in internal medicine required in professional activities, which are established on the basis of educational and professional program.

**1.2. The main tasks** of studying the elective discipline "**Functional diagnostics in internal medicine**" for 6th year students are:

- training of the applicant with formation of skills of the decision of professional problems according to the kinds of professional activity;
- formation of skills of communication with the patient, carrying out of the full range of diagnostic actions according to the clinical protocols of the management of patients at hospital and out-patient stages;
- development of the skills of interpretation of the results of routine and special instrumental methods of the research of bodies and systems;
- formation of the skills of statement, substantiation and formulation of the diagnosis, drawing up of the plan of inspection of the patients, definition of tactics of their conducting.

### **1.3. Learning outcomes: formation in students**

- knowledge of the theoretical foundations of methods of functional diagnostics in cardiology, rheumatology, gastroenterology and pulmonology;
- practical skills of conducting functional research in diseases of internal organs;
- ability to assess the role of new approaches to functional diagnostic methods in diseases of internal organs.

## 2. INFORMATION SCOPE OF THE COURSE

**Course 6.** Specific semester / academic year XI-XII

The volume of the discipline: ECTS credits - 3, a total of 90 hours, of which practical classes - 40 hours, VTS - 50 hours.

Type of control - differentiated test.

**The status of the discipline** - elective, **the format of the discipline** - mixed (combination of traditional forms of classroom learning with elements of e-learning on the platform Moodle, ZOOM, GoogleMeet), face-to-face and distance counseling.

**The methods of the training. Types of educational activities of the students according to the curriculum are: a) practical classes, b) individual work of the students (IWS).**

The thematic plans of practical classes and IWS ensure the implementation in the educational process of all topics included in the discipline.

The organization of the educational process ensures the participation of students in the examination of inpatients. If it is not possible to provide a survey of patients on the topic of the lesson, students are engaged in simulation classes or make a report on a relevant topic. Daily patient examination protocols are provided by the teacher for control.

The teachers ensure that each student receives the necessary competence in the following areas: questioning the patient, physical examination and functional diagnosis, oral presentation, diagnostic decision-making (critical thinking), filling out documentation.

### 2.1 THE CONTENT OF THE DISCIPLINE

#### 2.2.1. Topics of practical classes

<b>№</b>	<b>Topic</b>	
1.	Theoretical bases of an estimation of a functional condition of bodies, systems and an organism. Hardware and methodological bases of functional diagnostics.	5
2.	Functional research methods in cardiology: resting ECG	5
3.	Functional research methods in cardiology: ECG with exercise tests: treadmill test, bicycle ergometry.	5
4.	Functional research methods in cardiology: Daily ECG monitoring. Daily monitoring of blood pressure	5
5.	Functional research methods in cardiology: Echocardiography. Duplex ultrasound examination of blood vessels.	5
6.	Functional research methods in rheumatology: myography, video capillarography of the nail bed, functional lung tests	5
7.	Functional research methods in gastroenterology: intraesophageal pH-metry, esophagomanometry, intraesophageal ionometry,	5

	intra-gastric pH-metry, gastromanometry, electrogastrography, study of acid-forming functions of the stomach, fractional study of bile, radiostudy of the gastrointestinal tract	
8.	Functional research methods in pulmonology: research and interpretation of the results of determining the function of external respiration.	5
Total		40

### 2.2.2. Individual work

№	Topic	Number of hours
1	Legal bases. Organization of functional diagnostics service and ways of its development.	5
2	Basic devices for clinical functional diagnostics. Safety precautions when working with functional diagnostic equipment	5
3	Elaboration of information sources concerning functional research methods.	5
4	Issues of ethics and deontology in functional diagnostics	5
5	Functional pharmacological tests. Influence of drugs on functional indicators	5
6	Age and sex features of functional diagnostics	5
7	Methods of long-term registration of ECG and blood pressure	5
8	Contrast-enhanced vascular and cardiac examination methods. Angiography (coronary angiography, aortography, angiopulmonography), CT, MRI, etc .	5
9	Investigation of the functional state of the neuromuscular apparatus	5
10	Ultrasound research methods in gastroenterology. Fibroelastography.	5
Total		50

## 3. EVALUATION POLICY

**3.1.** Evaluation of the success of education of students is carried out on the basis of the current «Instructions for evaluating the educational activities of students of KhNMU»

*The current educational activity* is carried out and controlled by the teacher of the academic group, after students master each topic of the discipline, it is graded using a 4-point (traditional) system: "excellent", "good", "satisfactory" and "unsatisfactory".

Recalculation of the average assessment of current educational activity in the multi-scale scale of ECTS is carried out in accordance with the "Instructions for assessing the educational activity of students of KhNMU".

The minimum number of points that a student must score for admission to the exam - 70 points, the maximum number of points that a student can score - 120 points.

*The final semester control* is carried out after the completion of the study of the discipline in the form of a *differentiated test* by the teacher of the group in the last lesson.

The minimum positive score on the differentiated test is 50 points. The maximum number of points is 80 points.

If the differentiated test is not passed, the dates of re-setting during the holidays are set, before the beginning of the next semester.

Work is carried out according to the schedule (daily and on Saturdays) in person or remotely, within 30 days from the date of admission free of charge; after 30 days - paid or free with the permission of the dean.

### **3.2. The list of theoretical questions for preparation for differentiated credit**

- Basic ECG parameters. ECG analysis methods. Analysis of heart rate and conduction. Measurement of tooth amplitude, level of segments and duration of intervals.
- ECG in ischemic heart disease: stable and unstable angina, acute myocardial ischemia, myocardial infarction.
- Differential diagnosis of ST segment changes in coronary heart disease, hypertension, cardiomyopathy, etc.
- ECG with arrhythmia.
- Paroxysmal arrhythmias.
- ECG in violation of conduction (blockade).
- ECG with PQ shortening syndrome (WPW, CLC, LGL).
- Pacemaking. See EX. Indications for installation of SHVR.
- Diagnosis of arrhythmias and conduction according to HM ECG.
- Daily monitoring of blood pressure. Methods of conducting. Indications, contraindications. Patient's diary. Interpretation of DMAT results.
- Stress tests in the diagnosis of diseases. Explain the main stress tests, methods of conducting them. Explain the method of bicycle ergometric test
- Tests with dosed exercise. Methods of testing. Indications, contraindications. Criteria for termination of the exercise test.
- Methods of studying the mechanical activity of the heart. Echocardiography. Main positions.
- Ultrasound of left ventricular myocardial hypertrophy, BMD. Assessment of systolic and diastolic LV function.
- Ultrasound of the valvular apparatus and aorta, congenital heart disease.
- Ultrasound for myocardial infarction and its complications.
- Ultrasound of non-coronary heart disease.
- Ultrasound in pulmonary hypertension.
- Modern ultrasound and Doppler studies of the heart and vessels. Stress-ECHO-CG.
- Invasive methods of cardiovascular research. Methods of angiography and ventriculography. Методика реографії і дуплексного сканування серця і периферичних судин.
- Invasive methods of cardiovascular research. Methods of angiography and ventriculography.

- Magnetic resonance imaging methods. Contrasting. Indications and contraindications. Complication.
- Functional methods of research of the respiratory system. Spirography. FZD, evaluation of results. Inhalation provocative tests with drugs.
- Modern methods of research of the neuromuscular apparatus.
- Electromyography and electroneuromyography. Methods of electrophysical research.
- Methods of studying vascular tone of skeletal muscles and their blood supply.
- Research of the musculoskeletal system. Goniometry. Equipment for goniometry.
- FEGDS. Indications and contraindications. Evaluation of results.
- Daily pH-metry. Methods of conducting. Interpretation of results.
- Assessment of the hepatobiliary system. Ultrasound, fibroelastography.
- Evaluation of the results of the study of the function of external respiration

**3.3. Rules for appealing the assessment.** The student can appeal his positive assessment in accordance with the "Instructions for assessing the educational activities of students of KhNMU."

#### **4. DISCIPLINE POLICY AND VALUES**

To achieve the goal of training and successfully complete the course, it is necessary: to join the work from the first day; regularly attend practical classes, read the material in advance, before its consideration in a practical lesson; perform all necessary tasks and work every day; be able to work with a partner or in a group; ask for help and get it when you need it.

The use of electronic gadgets (mobile phone, tablet) is allowed during practical classes and is not allowed during all types of control.

Copying and plagiarism in the preparation of student research papers are not allowed. In the first lesson, teachers inform students about what exactly is considered plagiarism and how to properly conduct research.

Students with special educational needs should meet with the teacher or warn him before the start of classes, at the request of the student it can be done by the head of the group. If you have any questions, please contact the teacher.

For successfully complete the discipline, the student must be active during practical classes and perform the required minimum of academic work.

Students can receive additional points for individual tasks (report of the abstract in practice, report on the patient's medical history in practice, writing abstracts, articles, participation in national competitions, report to scientific conferences of the university, Ukraine and abroad).

The number of points accrued for different types of individual tasks depends on their scope and significance, but not more than 10 points. They are added to the amount of points earned by the student in the classroom during the current academic activity. In any case, the total amount of points for the current educational activity may not exceed 120 points.

All students must be instructed in safety, which is conducted at the beginning of the first lesson.



Necessary changes in the syllabus are approved by the methodical commission of KhNMU on professional training of disciplines of therapeutic profile and published on the site of KhNMU, the site of the Department of Internal Medicine № 2, clinical immunology and allergology named after academician L.T. Malaya, KhNMU.

## **5. ACADEMIC INTEGRITY**

The Department of Internal Medicine № 2, Clinical Immunology and Allergology named after academician L.T.Malaya maintains zero tolerance for plagiarism. Students are expected to constantly raise their awareness of academic writing. The first lessons will provide information on what to consider plagiarism and how to properly conduct research and scientific research.

## **6. RECOMMENDED LITERATURE**

### **6.1. Basic:**

1. G.D. Clifford, F. Azuaje, P. McSharry Advanced Methods And Tools for ECG Data Analysis (1st ed.), Artech House Publishers, 2006.
2. T. Barill The Six Second ECG: A Practical Guidebook to Basic ECG Interpretation nursecom, 2003.

### **6.2. Auxiliary:**

1. Chambers JB. Clinical Echocardiography. London: BMJ Books, 1995.
2. Feigenbaum HMD. Echocardiography, 5th edn. Philadelphia: Lea & Febiger, 1994.