

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
«Interpretation of Electrocardiography»

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 5th 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

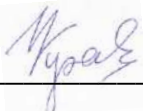


Professor Kravchun P.G.

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

Protocol
“ 31 ” august 2020 year № 1

Chairman



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. Dobrovol'ska Inna Mykolayivna, 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. Zaykina T.S., 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

Candidate of Medical Sciences, Professor Olga Kadykova, specialization internal medicine, cardiology, oi.kadykova@knmu.edu.ua

Candidate of Medical Sciences, Professor Natalia Ryndina, specialization internal medicine, cardiology, nh.ryndina@knmu.edu.ua

Candidate of Medical Sciences, Associate Professor Petro Rynchak, specialization internal medicine, cardiology, pi.rynchak@knmu.edu.ua

Candidate of Medical Sciences, Associate Professor Svitlana Krapivko, specialization internal medicine, cardiology, so.krapivko@knmu.edu.ua

Candidate of Medical Sciences, Associate Professor Yuliia Kovalova, specialization internal medicine, cardiology, yo.kovalova@knmu.edu.ua

Candidate of Medical Sciences, Associate Professor Tetiana Zaykina, specialization internal medicine, cardiology, ts.zaikina@knmu.edu.ua

Candidate of Medical Sciences, Assistant Professor Kateryna Borovyk, specialization internal medicine, cardiology, km.borovyk@knmu.edu.ua

Candidate of Medical Sciences, Assistant Professor Anna Sypalo, specialization internal medicine, cardiology, ao.sypalo@knmu.edu.ua

PhD, Assistant Professor Diana Minukhina, specialization internal medicine, dv.minukhina@knmu.edu.ua

PhD, Assistant Professor Oleksandr Shaporenko, specialization internal medicine, shaparenko.ov@knmu.edu.ua

Contact E-mail of the Department: kaf.2med.vnutrishnoiimed2@knmu.edu.ua
intmed2@ukr.net

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

General characteristics of the discipline: The discipline "**Interpretation of electrocardiography**" consists of seven sections, namely: "Bioelectric bases of electrocardiography", "Methods of electrocardiogram registration", "Normal electrocardiogram", "General scheme of ECG interpretation", "Cardiac electrocardiogram in disorders", "Electrocardiogram in conduction disorders", "Electrocardiogram in hypertrophy of the heart".

The role and place of the discipline in the system of training: The course "Interpretation of electrocardiography" is an important component of training specialists in both therapeutic and cardiac profiles, as it forms the necessary practical skills of electrocardiographic diagnostics in future professionals.

Prerequisites: medical physics, normal anatomy; normal physiology; topographic anatomy; pathological anatomy; pathological physiology; biochemistry.

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 teaching the discipline "**Interpretation of electrocardiography**" is to form students' ability to make a plan of examination of the patient in the typical course of the disease, methodically correct ECG diagnosis in the clinic of internal medicine and interpret its results according to modern algorithmic protocols.

1.2. The main tasks of studying the discipline "**Interpretation of electrocardiography**" are:

- acquisition by students of knowledge of normal and pathological ECG;
- mastering the skills of ECG recording in the conventional 12 leads;
- mastering the skills of analysis of normal and pathological electrocardiogram and clinical interpretation of the obtained data;
- mastering the skills of writing the ECG report of the conclusion;
- acquisition of knowledge on ECG changes in disorders of automatism, excitability and conductivity;
- study of ECG signs of hypertrophy of the heart.

1.3. Studying outcomes: After passing the discipline the student must know:

- the principle of the ECG method and its anatomical and physiological basis (basic concepts of electrophysiology of the heart, the structure of the conduction system of the heart);
- modern methods of clinical, laboratory, instrumental examination of patients with pathology of the cardiovascular system;
- general scheme of interpretation of electrocardiography;

- mechanisms of arrhythmias, ECG signs of disorders of automaticity and excitability, the principles of emergency care for paroxysms and tachyarrhythmias;
- ECG signs of block
- classification of arrhythmias and conduction of the heart;
- ECG changes in hypertrophy of the heart.

1.4. After passing the discipline the student must be able to:

- collect data of patient complaints, medical history, life history, conduct and evaluate the results of physical examination;
- evaluate information about the diagnosis, using a standard procedure based on the results of laboratory and instrumental studies;
- establish a preliminary and clinical diagnosis;
- record the ECG in the standard 12 leads;
- interpret normal and pathological electrocardiogram;
- diagnose arrhythmias and conduction of the patient by clinical manifestations and electrocardiogram, provide emergency care for arrhythmias;
- detect ECG signs of hypertrophy of the heart and assess the primary disorders of repolarization ("systolic overload") in left ventricular hypertrophy;
- form goals and determine the structure of personal activities;
- keep medical records of the patient (ECG report) on the basis of regulatory documents;
- adhere to a healthy lifestyle, use the techniques of self-regulation and self-control;
- be aware of and guided in their activities by civil rights, freedoms and responsibilities, raise the general cultural level;
- adhere to the requirements of ethics, bioethics and deontology in their professional activities;
 - organize the necessary level of individual safety (one's own and those cared for) in case of typical dangerous situations in the individual field of activity.

2. INFORMATION SCOPE OF THE COURSE

The course -5

Year of preparation - 5, semester - 9

Number of credits - 3

The total number of hours - 90

Hours for full-time study: classes - 20, independent student work - 70

Discipline status - selective; discipline format - mixed.

Teaching methods: lectures (using multimedia support), practical classes, VTS; methodical recommendations (see below), presentations; distance learning (Internet conferences on the Zoom network).

2.1 THE CONTENT OF THE DISCIPLINE

2.2.1. Topics of practical classes

No theme	Theme	Number of hours
1.	General principles of ECG. Technique of recording ECG. Normal electrocardiogram. Formation of ECG-conclusion.	5
2.	Heart rate and its disorders. Conductivity of the heart and its violation.	5
3.	Hypertrophy of the atrium and ventriculars	5
4.	ECG with myocardial infarction	5

2.2.2. Independent students work

No theme	Theme	Number of hours
1.	Membrane theory of biopotentials.	3
2.	Main functions of the heart	2
3.	Formation of an electrocardiogram when a wave of excitation spreads through the heart. Depolarization and repolarization of the ventricles.	2
4.	Six-axial coordinate system	2
5	Determination of the position of the electrical axis of the heart. Analysis of the main teeth.	3
6	Analysis of cardiac regularity. Counting the number of heart attacks. Determination of the source of excitation (sinus, atrial, idioventricular rhythm, rhythms with AV-connection). Conductivity function estimation	3
7	The main electrocardiographic signs of sinus arrhythmias: sinus tachycardia, sinus bradycardia, sinus arrhythmia, sinoatrial node weakness syndrome	3
8	Slow and accelerated ectopic rhythms and complexes. Non-paroxysmal tachycardia. Migration of the supraventricular rhythm driver.	3
9	The concept of PC, as the premature appearance of the heart cycle, and the mechanisms of its development. Various forms of extrasystols (atrium, ventricular, with AV-compound) and their reflection on the electrocardiogram.	3
10	Prognostic-dangerous variants of extra systolic arrhythmias	5
11	Paroxysmal tachycardia. The most characteristic ECG are signs of atrial, ventricular and atrioventricular forms of paroxysmal tachycardia.	4

12	Atrium fluttering. Illustration on the electrocardiogram of the correct (regular) and irregular (irregular) forms.	2
13	Atrium fibrillation (flashing arrhythmia) as consequences of the appearance of several ectopic impulse foci. Paroxysmal, persistent and constant nature of atrial fibrillation. The most characteristic ECG criteria are flashing arrhythmia.	3
14	Fluttering and fibrillation of the ventricles as an emergency. Characteristic differential-diagnostic ECG signs of fluttering and fibrillation of the ventricles.	3
15	The concept of heart blocks. Pathogenesis of sinoatrial block. Frequency of detection in clinical practice of interatrial blocks.	3
16	ECG characteristic of atrioventricular block of the 1st degree. Three types of AV blockades of the SECOND degree: type I Mobitz, type II Mobitz, type III (high-level blockade).	3
17	Complete AV block (AV block of the third degree). Differential diagnosis of degrees of atrioventricular blockades according to the interpretation of electrocardiograms.-	3
18	The ECG phenomenon of Fredeyck syndrome as a combination of complete AV block with fibrillation or flutter.	2
19	An unusual course of arousal in the myocardium of the ventricles of the heart as consequences of a complete block of the right or left leg of the his. The variability of the ECG forms of the ventricle complex during the blocks of bundle of his.	3
20	The concept of an incomplete blocks. Electrocardiographic criteria of incomplete block of the right leg or front or rear branch of the left leg. Focal intraventricular blockade.	3
21	Factors of variability of electrocardiographic changes manifested in hypertrophy of different parts of the heart. The boundary between ecg manifestations of hypertrophy of the left and right atriums. Overload of hypertrophic atriums as a manifestation of their transient hyperfunction.	3
22	Heart hypertrophy as compensatory myocardial reaction	3
23	The most accurate ECG signs of hypertrophy of the left and right ventricles	3
24	Features of diagnostic tactics for combined hypertrophy of both ventricles.	3

2.2.3. Individual tasks

Writing abstracts (with multimedia presentations). Requirements: the presence of all structural units, appropriate design, expression of opinion in the conclusions, processing

of at least 6 sources of literature, public protection of the main provisions, the presence of media coverage.

2.2.4. Approximate topics of abstracts:

1	Criteria for the validity of setting an artificial pacemaker in SSN sick sinus node syndrome
2	Mechanism re-entry as a trigger for the formation of heterotopic cycles and rhythms, mainly not associated with violations of automatism
3	Clinical case of Morgan-Adams-Stokes syndrome in patients with heart conductivity disorders
4	Frederyk phenomenon in gerontology
5	Mital heart defects as the prevailing cause of hypertrophy of the myocardium of the left atrium and right ventricle

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»

Organization of current control.

Assimilation of the topic (current success) 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, solving situational problems, monitoring the acquisition of practical skills, the current survey. The final lesson (SO) must be conducted in accordance with the curriculum during the semester on a schedule, during classes. Acceptance of software is carried out by the teacher of the academic group. Assessment is carried out according to the traditional 4-point system: "excellent", "good", "satisfactory" and "unsatisfactory". The final score for the current learning activity (PND) and the final classes (PZ) is defined as the arithmetic mean of the traditional grades for each class and PZ, rounded to 2 decimal places and converted into a multi-point scale in accordance with Table 2.

The minimum number of points that a student must score for the current activity during the study of the section is 120 points, the maximum number of points - 200 points.

Assessment of students' independent work.

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

Assessment of individual student tasks is carried out under the conditions of the teacher's tasks (report of the abstract in a practical lesson). Points (not more than 10) are added as incentives. The total amount of points for the current educational activity may not exceed 200 points.

The organization of the final control - credit. The test is conducted by the teacher of the academic group at the last lesson in the discipline and involves taking into account the IPA and checking the mastering of all topics in the discipline in the form of an interview. The grade is determined in points from 120 to 200 and marked - "credited", "not credited". "Not credited" is given to students who have not completed the program in full (have unsatisfactory grades or unfulfilled academic arrears). , "D", "E") and the traditional system ("satisfactory", "good", "excellent")

4). According to the number of points obtained, the statement of success of students in the discipline and the appendix with the personal account of students who did not meet the requirements of the curriculum of disciplines (F, FX). The FX grade is given to students who were admitted to the test but did not pass it. A grade of F is given to students who are not admitted to the test.

Grade from the discipline. The discipline is studied during the 1st semester, the grade for the discipline is defined as the arithmetic mean of the points for the semester during which the discipline was studied, which are translated into a 200-point ECTS scale.

The maximum number of points that a student can score for studying the discipline - 200 points. The minimum number of points is 120 points.

The grade in the discipline is given only to students who have passed all practical classes and tests. If the test is not passed, the dates of rescheduling during the holidays are set, until the beginning of the next semester.

Students who have not been admitted to the test or have not passed it, have the right to liquidate the current account

Students who have not been admitted to the credit or have not passed it, have the right to liquidate the current academic debt and reschedule the credit within the current semester, as well as within the approved schedule for two weeks during winter or summer vacation after completion. semester, or academic year.

Elimination of academic debt. Omissions of practical classes are worked out hour by hour to the teacher of group or the next teacher. Admission and consultations are held by prior arrangement with the teacher of the group, daily from 15:00 to 17:30 regular teacher, on Saturdays according to the "Regulations on the procedure for students to study".

Rules for appealing the assessment. If a student does not agree with the received grade on the topic / section / exam / discipline, he has the right to require re-assessment of his knowledge and skills by a commission consisting of the head of the department responsible for educational work at the department and several teachers.

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

- Membrane theory of the origin of cardiac biopotentials.
- Basic heart functions.
- Main teeth, segments and intervals on a normal electrocardiogram.
- General scheme of ECG interpretation.

- General classification of cardiac arrhythmias.
- Pathogenetic mechanisms of arrhythmia formation.
- The main electrocardiographic signs of sinus arrhythmias.
- Slow and accelerated ectopic rhythms and complexes.
- Different forms of extrasystole and their reflection on the electrocardiogram.
- The most characteristic ECG signs of atrial, ventricular and atrioventricular forms of paroxysmal tachycardia.
- Illustration on the electrocardiogram of the correct and incorrect forms of atrial fibrillation.
- The most characteristic ECG criteria for atrial fibrillation.
- Ventricular fibrillation and fibrillation as an emergency.
- The concept of heart block.
- Differential diagnosis of degrees of atrioventricular block according to the interpretation of the electrocardiogram.
- Morgan-Adams-Stokes syndrome as a clinical syndrome - "satellite" AV-blockade.
- Variability of ECG forms of the ventricular complex during blockade of the legs of the His bundle.
- The concept of incomplete blockade of the legs of the His bundle.
- Factors of variability of electrocardiographic changes found in hypertrophy of different parts of the heart.

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 goals of training and successfully complete the course, you must:

1) From the first day to join the work.2) Attend lectures regularly.3) Read the material in advance, before its consideration in a practical lesson.4) Do not be late and do not miss classes.5) Come to the department dressed in a medical gown, in changeable shoes, have a phonendoscope, notebook, pen.6) Perform all necessary tasks and work every day.7) Be able to work with a partner or in a group.8) Ask for help and get it if necessary.

Academic mobility, interchangeability of credit credits (volume of 1 credit 30 hours) is provided. Students have the right to discuss various tasks, but their performance is strictly individual. It is strictly forbidden to write down, use any software, tips, mobile phone, tablet or other electronic gadgets during the lesson. If a student is noticed to be written off in a practical lesson, the teacher has the right to remove him from the classroom with a grade in the journal "unsatisfactory", the order of which is identical to the practice of missed classes.

Students with special needs must meet with the teacher in advance or warn him before the start of classes, at the request of the student it can be done by the head of the

group. The program of the discipline provides for the calculation of incentive points for participation in student scientific conferences, competitions, research, writing articles in scientific journals in the amount of 3 to 20 points per semester, but only if the total number of points for the discipline does not exceed 200 points.

In case of changes in the syllabus, the current version will be available on the discipline page in Moodle, indicating the date of the last edit.

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. Shved MI, Grebenik MV Fundamentals of practical electrocardiography: a textbook. - Ternopil: Ukrmedbook, 2000. -
2. ECG in practice a textbook / John R. Hampton; translation of the 6th English. edition, trilingual. - All-Ukrainian specialized edition "Medicine", 2018. - 560 p. - ISBN978-617-505-713-1.
3. Electrocardiography: textbook. manual / VV Murashko, AV Strutynsky. - 14th ed., Reworked. - M. :

6.2. Auxiliary:

1. ECG - signs of disorders of automatism, excitability of the myocardium: guidelines for practical training of students in propaedeutics of internal medicine / compilers: TV Ascheulova, TM Ambrosova. - Kharkiv: KhNMU, 2018. - 26 p.
2. ECG - signs of conduction function disorders: methodical instructions for practical classes of students in propaedeutics of internal medicine / TV Ascheulova, TM Ambrosova. - Kharkiv: KhNMU, 2018. - 11 p.