

MINISTRY OF HEALTH OF UKRAINE
ODESA NATIONAL MEDICAL UNIVERSITY

International faculty

Department of Family Medicine and Polyclinic Therapy

Syllabus of the academic discipline
"Express ECG analysis"

Amount	Total number of hours per discipline: 90 hours, 3 credits. Elective discipline. XI-XII semesters. 6th year of study.
Days, time, place	According to the class assignments. Department of family medicine and polyclinic therapy Odesa, str. Pishonivska, 1, Premises base of the Department of Family Medicine and Polyclinic Therapy, 5th floor.
Teacher(s)	Tsyunchyk Yu. H. PhD in Medicine, Associate Professor Portnova O.O. PhD in Medicine, Associate Professor Lahoda D. O., PhD, assistant Bazhora Ya. I., PhD, assistant Nazarian V. M., assistant
Contact Information	Help by phone: Danylchuk Halyna Oleksandrivna, associate professor of the department 097 305 4035 Tsyunchyk Yuliia Henadiivna, responsible teacher for organizational and educational work with students of the department 050 333 5888 E-mail: galina.danylchuk72@gmail.com Face-to-face consultations: from 2:00 p.m. to 5:00 p.m. every Thursday, from 9:00 a.m. to 2:00 p.m. every Saturday Online consultations: from 4:00 p.m. to 6:00 p.m. every Thursday, from 9:00 a.m. to 2:00 p.m. every Saturday. The link to the online consultation is provided to each group during classes separately.

COMMUNICATION

Communication with the student will be conducted in the classroom (face-to-face). During distance learning, communication is carried out through the Microsoft Teams platform, as well as through e-mail correspondence, and Viber or Telegram messengers (through groups created in Viber or Telegram for each group, separately through the head of the group).

COURSE ANNOTATION

The subject of the study of the discipline is the peculiarities of the assessment of electrocardiological research in normal conditions and in cardiovascular and extracardiac pathology.

Prerequisites and post-requisites of the discipline (place of the discipline in the educational program):

Prerequisites: Ukrainian language (by professional direction), foreign language (by professional direction), Latin language and medical terminology, medical and biological physics, human anatomy, histology, physiology, life safety; basics of electrophysiology, pathomorphology, pathophysiology, pharmacology, cardiology.

Post-requisites: general practice - family medicine, internal medicine, cardiology, gastroenterology, endocrinology, infectious diseases, epidemiology and principles of evidence-based medicine, anesthesiology and intensive care, emergency and critical care.

The purpose is acquisition of additional knowledge and mastering of professional competences and skills of electrocardiogram interpretation; registration, evaluation of ECG data, using the ECG in diagnosis, differential diagnosis and determining the treatment approach.

The tasks of the discipline are the following:

1. Formation of skills and abilities to evaluate a normal electrocardiographic curve.
2. Formation of skills and abilities to evaluate ECG data in the case of heart rhythm and conduction disorders, insufficiency of blood supply to the heart, electrolyte disorders in the body of various origins.
3. Improving the skills of substantiation of clinical diagnosis, differential diagnosis using the ECG.
4. Mastering the ability to determine the tactics of emergency care, management, treatment and prevention of the most common diseases of the cardiovascular system under the control of an ECG study.

Expected results:

As a result of studying the discipline, the student has to

Know:

algorithms for analyzing the electrocardiogram in normal and pathological conditions.

Be able:

- to register an electrocardiogram
- to evaluate the parameters of the electrocardiographic curve
- to carry out a clinical evaluation of the ECG according to standard methods
- to carry out differential diagnosis and substantiate the clinical diagnosis using ECG data
- to determine the tactics of management of the patient and provide emergency medical care in case of emergencies, the need for hospitalization
- to keep medical documentation

COURSE DESCRIPTION

Forms and methods of education

It will teach the discipline as practical classes (30 classroom hours) and organization of the student's independent work (90 hours).

Teaching methods: conversation, role-playing, solving clinical situational problems, tests, practicing the skills of working with an ECG.

The content of the educational discipline

Content module 1.

Algorithm of electrocardiogram analysis

Topic 1. Physic-technical basics of electrocardiography. ECG - lead.

Clinical significance of the electrocardiography method. Characteristics of the main properties of the heart muscle. The essence and patterns of electrophysiological processes occurring in the myocardium. ECG recording technique. Lead of a standard ECG. Additional ECG leads. The main elements of the ECG.

Topic 2. Normal electrocardiogram. Clinical assessment of ECG parameters.

Determination of the source of excitation and regularity of heart rhythm. Criteria of sinus rhythm. Determination of heart rate. Determination of the position of the electrical axis of the heart, calculation of the alpha angle. Morphological assessment of the main elements of the ECG: norms and deviations from the norm. ECG signs of atrial hypertrophy. ECG signs of ventricular hypertrophy.

Topic 3. 24-hour-ECG monitoring. Indications, clinical significance.

Basics of the "Holter monitoring of ECG" method. Indications and contraindications to the Holter monitoring. Methodological recommendations for Holter ECG monitoring. Electrocardiographic parameters of 24-hour-ECG monitoring.

Content module 2.

ECG assessment of cardiac arrhythmia

Topic 4. ECG features in sinus node disorders (monotopic arrhythmias)

Definition and classification of cardiac arrhythmias. ECG - criteria for sinus tachycardia, sinus bradycardia, sinus arrhythmia, diagnostic value

Topic 5. ECG features in ectopic (heterogeneous rhythm disturbances)

Paroxysmal tachycardia: definition of the concept, classification. ECG signs of various forms of paroxysmal supraventricular tachycardia. Atrial fibrillation and flutter: definitions, forms, ECG signs. Paroxysmal ventricular tachycardia, ventricular fibrillation and flutter: ECG pattern. ECG signs in different variants of extrasystoles.

Topic 6. ECG features in heart conduction disorders

Heart blocks: types, their characteristics. ECG signs of various types of conduction disorders: sinoatrial, atrioventricular, intraventricular blockade. Basic approaches to emergency care and further management of the patient.

Topic 7. ECG-syndromes and ECG-phenomena

Wolf-Parkinson-White syndrome (WPW). Syndrome of shortened P-Q interval. Syndrome of early ventricular repolarization. Syndrome of prolonged Q-T interval: syndrome of weakness of the sinus node. Morgana-Edems-Stokes syndrome. Frederick's syndrome. ECG signs. Basic approaches to emergency care and further management of the patient.

Content module 3.

Electrocardiographic assessment in coronary and non-coronary heart diseases

Topic 8. ECG changes in ischemic heart disease

The main ECG signs of ischemia, damage and necrosis of the myocardium. The conception of "acute coronary syndrome" (ACS). ECG signs in ACS without ST segment elevation and with ST segment elevation. Topical diagnosis of myocardial infarction, use of additional leads. Vasospastic angina pectoris, differential diagnosis.

Topic 9. ECG changes in non-coronary heart diseases (myocarditis, pericarditis, cardiomyopathy)

Peculiarities of ECG signs in pericarditis, clinical significance. Features of ECG signs in myocarditis, clinical significance. Features of ECG signs in cardiomyopathies, clinical significance.

Topic 10. ECG criteria of hypertrophy of heart chambers

Factors of variability of electrocardiographic changes, which are detected in hypertrophy of different parts of the heart. The boundary between the ECG manifestations of left and right atrial hypertrophy. The most reliable ECG signs of hypertrophy of the left and right ventricles.

Topic 11. ECG criteria for electrolyte disturbances

Features of the ECG pattern in hyper- and hypokalemia. Features of the ECG pattern in hyper- and hypocalcemia.

RECOMMENDED LITERATURE

Basic:

1. The ECG. Made easy. Ninth edition / John Hampton, Joanna Hampton. Elsevier, 2019. 207 pages.
2. The ECG Made Practical / John Hampton, David Adlam – Elsevier, 2019. 341 pages.
3. Family Medicine: in 3 books. Book 3. Special Part. Multidisciplinary General Medical Practice: textbook / O.M. Hyrina, L.M. Pasiyeshvili, L.S. Babinets et al. Kyiv, 616 P., 2020
4. Fred Kusumoto. ECG Interpretation. From Pathophysiology to Clinical Application. Second edition / Fred Kusumoto. Springer, 2020.

Additional:

1. 150 ECG Cases / John Hampton, David Adlam, Joanna Hampton – Elsevier, 2019. 329 pages.
2. Anatomy of the cardiac conduction system. Pacing Clin Electrophysiol / Santosh K Padala, José-Angel Cabrera, Kenneth A Ellenbogen – NIH, PubMed, Sensors (Basel), 2021 Jan; 44(1):15-25. doi: 10.1111/pace.14107. – URL: <https://pubmed.ncbi.nlm.nih.gov/33118629/>
3. EKG | ECG Interpretation Made Easy: An Illustrated Study Guide For Students To Easily Learn How To Read & Interpret ECG Strips Paperback – NEDU LLC, 2021. 156 pages.
4. Electrocardiogram / Yasar Sattar, Lovely Chhabra – StatPearls [Internet] – Last Update: June 13, 2022. URL: <https://www.ncbi.nlm.nih.gov/books/NBK549803/>

EVALUATION

Forms and methods of current control: oral survey, testing, assessment of performance of practical skills, solution of situational clinical tasks, assessment of activity in class.

Criteria of ongoing assessment at the practical class

Score	Assessment criterion
Excellent «5»	<p>The student participates actively in the seminar class. He/she demonstrates profound knowledge and provides full and detailed answers. He/she participates actively in discussing problem situations. He/she uses additional educational and methodological and scientific literature. The student knows how to form his attitude to a certain issue and conveys his/her attitude to the issue, gives appropriate examples. He/she knows how to find the most adequate forms of conflict resolution.</p> <p>The tests are completed in full, all 100% of the answers are correct, the answers to the open questions are complete and justified.</p> <p>The student freely solves situational tasks (including calculations), confidently demonstrates practical skills on the theme of seminar class and correctly interprets the data obtained. He/she expresses his own creative opinion on the theme, demonstrates creative thinking.</p>
Good «4»	<p>The student participates in the seminar class. He/she have mastered the material of the seminar class and shows the necessary knowledge, but answers the questions with some mistakes. He/she participates in discussing problem</p>

	<p>situations. He/she uses the basic educational and methodological and scientific literature. The student expresses his own opinion on the theme of seminar class. The tests are completed in full, not less than 70% of the answers are correct, the answers to the open questions are generally correct, but there are some mistakes in definitions.</p> <p>The student correctly solves situational tasks (including calculations), but admits minor inaccuracies and demonstrates more standardized practical skills on the theme of seminar class with correct interpretation of the received data. He/she expresses his own opinion on the theme, demonstrates creative thinking.</p>
Satisfactory «3»	<p>The student sometimes participates in the seminar class. He/she partially intervenes and asks questions, answers the questions with mistakes. He/she passively works in practical exercises. He/she demonstrates fragmentary knowledge of the conceptual apparatus and literary sources.</p> <p>The tests are completed in full, not less than 50% of the answers are correct, the answers to the open questions are illogical, with obvious significant errors in definitions.</p> <p>The student does not have sufficient knowledge of the material to solve situational problems (including calculations). He/she uncertainly demonstrates practical skills on the theme of seminar class and interprets the data with significant errors, does not express his/her opinion on the topic of the situational problem.</p>
Unsatisfactory «2»	<p>The student does not participate in the seminar class, just observes the learning process. He/she never speaks out or asks a question. He/she is disinterested in the study of the material. The student gives incorrect answers to questions, demonstrates poor knowledge of the conceptual apparatus and literary sources.</p> <p>The test has not been completed.</p> <p>The situation task has not been completed.</p>

Forms and methods of final control:

Credit Test is considered, if the student has completed all the tasks of the working program of the educational discipline. He/she took actively participated in the practical exercises, and completed an individual task. The student has an average current rating of at least 3.0 and has no academic debt.

Possibility and conditions for obtaining additional (bonus) points: not provided.

INDEPENDENT WORK OF STUDENTS

Independent work involves preparation for each practical class.

EDUCATIONAL DISCIPLINE POLICY

Deadline and re-take policy

- Absences of classes for non-respectable reasons are worked out according to the schedule of the teacher on duty.
- Absences due to valid reasons are processed according to an individual schedule with the permission of the dean's office.

Academic Integrity Policy:

Students must observe academic integrity, namely:

- independent performance of many works, tasks, forms of control provided for by the work program of this educational discipline;
- references to sources of information with using ideas, developments, statements, information;
- compliance with the legislation on copyright and related rights;
- provision of reliable information about the results of one's own educational (scientific) activity, used research methods and sources of information.

Unacceptable in educational activities for participants of the educational process are:

- using family or official ties to get a positive or higher grade during any form of control of learning outcomes or academic performance;
- use of prohibited auxiliary materials or technical means (cheat sheets, notes, micro-earphones, telephones, smartphones, tablets, etc.) during control measures;
- passing procedures for control of training results by fake persons.

For violation of academic integrity, students may be held to the following academic responsibility:

- a decrease in the results of an assessment of control work, assessment in class, credit, etc.;
- retaking the assessment (control work, credit, etc.);
- appointment of additional control measures (additional individual tasks, control works, tests, etc.);
- inspecting other works by the violator.

Attendance and Tardiness Policy:

Uniform: a medical gown that completely covers the outer clothing, or medical pajamas, a cap, a mask, and a change of shoes.

Equipment: notebook, pen.

State of health: students suffering from acute infectious diseases, including respiratory diseases, are not allowed to attend classes.

A student who is late for class can attend it, but if the teacher has put "nb" in the journal, he must re-take it in the general order.

Mobile devices

Mobile devices may be used by students with the permission of the instructor if they are needed for the assignment.

Behavior in the audience:

The behavior of students and teachers in the classrooms must work and calm, strictly comply with the rules established by the Regulations on academic integrity and ethics of academic relations at Odessa National Medical University, under the Code of Academic Ethics and University Community Relations of Odessa National Medical University, Regulations on Prevention and detection of academic plagiarism in the research and educational work of students of higher education, scientists and teachers of Odessa National Medical University.