MINISTRY OF HIGHER EDUCATION, SCIENCE AND INNOVATIONS OF THE REPUBLIC OF UZBEKISTAN

MINISTRY OF HEALTH REPUBLIC OF UZBEKISTAN

TASHKENT STATE MEDICAL UNIVERSITY

APPROVED

First vice-rector for Academic Affairs

_____ K. N. Khaitov

"26" IX 2025

EDUCATIONAL AND METHODOLOGICAL COMPLEX

On the subject of "Simulation-Based Education"

Field of knowledge: 900 000 – Healthcare and Social affairs

Field of education: 910 000 – Health Care

Direction of education: 60910200 –General medicine

TASHKENT-2025

The educational and methodological complex for the specialty 60910200 – General Medicine has been developed in accordance with the requirements of the State Educational Standard of Higher Education.

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The educational and methodological complex of the discipline was approved by the decision of the Central Methodological Council of the Tashkent State Medical University dated on September 17, 2025, № 1.

EDUCATIONAL METHODOLOGICAL COMPLEX
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Educational materials and lecture sessions

Thematic Plan of Lectures for the Subject "Simulation-Based Education"

№	Topic	Hours
1	Simulation-Based Education: Diagnostic Methods for Pulmonary and Cardiac Diseases.	**2**
2	Simulation-Based Education: Basic Cardiopulmonary Resuscitation (BLS)	**2**
	Total	**4**

Thematic Plan of Practical Training Sessions

№	Topic	Hours
1.	Lung Auscultation. Improving lung auscultation techniques using simulator trainers and learning to make preliminary diagnoses for various diseases	4
2.	Cardiac Auscultation. Improving cardiac auscultation techniques using simulator trainers and learning to make preliminary diagnoses for various diseases	4
3.	Assessment of Emergency Conditions in Patients. Basic Cardiopulmonary Resuscitation. Complications during CPR. Removal of foreign bodies from the upper airway (Heimlich maneuver)	3
Jami		**11**

Chronological Structure of Lecture Sessions

Time	Content
5 minutes	Introduction to the lecture
5 minutes	Lecture objectives, tasks, and significance
65 minutes	**Main part:** key concepts and terminology; clinical presentation linked to simulation; diagnosis, treatment, and prevention; clinical cases
5 minutes	Concluding part

Chronological Structure of Practical Training Sessions

№	Activity	Time / Duration
1	Theoretical analysis of the topic – briefing	8.00-9.20
2	Break	9.20-9.30
3	Performing practical skills using simulation technologies	9.30-10.50
4	Break	10.50-11.00
5	Discussion of case-based problems and tests – debriefing	11.00-12.00
6	Discussion of independent learning tasks related to the topic	12.00-12.30

Note: Adjustments may be made depending on the specific characteristics of the subject.

Structure of the lecture text

Lecture topic

Lecture №1
Topic: Simulation training: methods of diagnosing lung and heart diseases.

Hours - 2 academic hours (80 minutes).

Lecture Outline

1. **Introduction.**
   - Lecture plan
   - Objectives and tasks of the lecture
   - Significance of simulation-based education for the topic
2. **Main Part**
   - Key concepts and terminology
   - Clinical presentation
   - Diagnostic methods
   - Treatment and prevention
   - Prognosis and complications
   - Clinical cases
3. **Conclusion**
   - Key conclusions
   - Control questions
4. **References**

Objectives and Tasks of the Lecture

Objective:

To develop students' practical skills in diagnosing pulmonary and cardiac diseases using simulation-based education technologies, to teach standardized stages of the diagnostic process, and to enhance clinical reasoning.

Tasks of the Lecture:

1. To explain the importance of simulation-based education in medical training.
2. To present the main clinical signs of pulmonary diseases and demonstrate the possibility of reproducing them using simulators.
3. To teach diagnostic methods for cardiac diseases, including auscultation, percussion, ECG simulation, and ultrasound (echocardiography) simulation.
4. To develop competencies in the use of high-technology simulators for pulmonary and cardiac diagnostics.
5. To enhance students' practical skills, clinical decision-making abilities, and rapid diagnostic thinking.

Significance of Simulation-Based Education for the Topic

Simulation-based education is a modern approach in medical training that enables the study of real clinical situations in a safe, controlled, and repeatable environment. Since diagnosing pulmonary and cardiac diseases is one of the most critical stages of clinical practice, simulation-based training provides the following advantages:

1. **Safe Learning Environment**
   Students acquire skills in auscultation, percussion, spirometry, and ECG interpretation without risking harm to real patients.
2. **Repetition and Skill Reinforcement**
   Clinical signs can be practiced repeatedly, including:
   - Normal breath sounds
   - Pathological breath sounds
   - Cardiac murmurs
   - Arrhythmia simulations

3. **Reduction of Diagnostic Errors**
   Student errors are immediately analyzed, and clinical reasoning is strengthened through the modeling of complex clinical scenarios.
4. **Standardized Training**
   All students are exposed to identical clinical cases, ensuring objective and fair assessment.
5. **Development of Rapid Decision-Making Skills**
   Safe simulation of acute conditions such as acute heart failure, bronchospasm, asthma attacks, and acute respiratory failure is possible.

Main Part

1. Diagnosis of Pulmonary Diseases in Simulation-Based Education

Main Clinical Signs of Pulmonary Diseases

- Dyspnea
- Cough (dry or productive)
- Wheezing and crackles
- Changes in percussion findings
- Decreased spirometric parameters

Lung Auscultation Using Simulators

Simulation mannequins can reproduce the following sounds:

- Dry wheezes
- Moist crackles
- Crepitation
- Signs of emphysema
- Obstructive breath sounds

Students practice:

- Differentiation of breath sounds
- Identification of pathological sounds
- Formulation of clinical diagnoses

Spirometry Simulation

Simulators allow training in:

- Measurement of FEV_1, FVC, and FEV_1/FVC ratio
- Assessment of the degree of airway obstruction
- Differentiation between asthma and chronic obstructive pulmonary disease (COPD)

Simulation of Acute Pulmonary Syndromes

- Asthma attack
- Acute respiratory distress syndrome (ARDS)
- Pneumothorax
- Bronchial obstruction

Students are trained to make appropriate clinical decisions in situations closely resembling real clinical conditions.

2. Diagnosis of Cardiac Diseases in Simulation-Based Education

Cardiac Auscultation Simulation

Simulators reproduce the following heart sounds:

- Normal S1 and S2
- Additional S3 and S4 sounds
- Mitral regurgitation
- Aortic stenosis
- Valve prolapse
- Arrhythmic changes

Students learn to:

- Differentiate cardiac murmurs
- Recognize pathology based on sound characteristics
- Establish etiological diagnoses

ECG Simulation

Simulation systems allow training in:

- Sinus rhythm
- Arrhythmias
- Conduction blocks
- Ischemic changes
- Signs of acute myocardial infarction

Students analyze each ECG pattern and make appropriate clinical decisions.

Cardiac Ultrasound (Echocardiography) Simulation

Using virtual ultrasound devices, students study:

- Ejection fraction (EF)
- Valve motion
- Cardiac chamber dimensions
- Presence of pericardial effusion

Simulation of Acute Cardiac Syndromes

- Acute coronary syndrome
- Acute heart failure
- Arrhythmic attacks

These training sessions significantly enhance students' clinical reasoning skills.

Conclusion

Simulation-based education is an integral component of modern medical training, particularly in the diagnosis of life-threatening pulmonary and cardiac conditions. Through the use of simulators, students develop essential competencies in practical skills, rapid diagnostics, clinical decision-making, auscultation, and ECG interpretation.

This ultimately contributes to improving the quality of medical care provided to patients.

References

1. Collins G.R. et al. *Simulation in Clinical Medicine*. Oxford, 2018.
2. European Society of Cardiology (ESC) Guidelines, 2023.
3. Global Initiative for Chronic Obstructive Lung Disease (GOLD) Report, 2024.
4. American Heart Association (AHA). *Auscultation Standards*, 2022.
5. World Health Organization (WHO). *Medical Simulation and Patient Safety*. Geneva, 2021.
6. Uzbekistan Medical Academy. *Methodological Guidelines for Simulation Centers*, 2020.

LECTURE №2
Simulation-Based Education: Basic Cardiopulmonary Resuscitation (BLS)

Duration: 2 academic hours (80 minutes)

I. Objectives and Tasks of the Lecture

Objective

To develop students' skills in performing **Basic Life Support (BLS)** through simulation-based education technologies, and to teach the correct algorithm for providing assistance to unconscious and non-breathing patients.

Tasks of the Lecture

1. To explain the concept, importance, and algorithm of Basic Life Support.
2. To demonstrate the role of simulation-based education in teaching BLS.
3. To teach the correct sequence of chest compressions, artificial ventilation, and the use of an automated external defibrillator (AED).
4. To develop students' practical clinical thinking based on simulation scenarios.
5. To enhance rapid decision-making skills in life-threatening situations.

II. Significance of Simulation-Based Education for BLS

Simulation-based education is a modern pedagogical technology that allows the repetition of real clinical situations in a safe environment and supports the automation of practical skills.

Basic cardiopulmonary resuscitation is the first and most critical link in emergency medical care. Simulation-based training provides the following advantages:

1. **Safety**
   Students practice BLS without causing harm to real patients.
2. **Repetitive Practice**
   Unlimited repetition of chest compressions, ventilation, and AED application is possible.
3. **Simulation of Real Clinical Scenarios**
   - Cardiac arrest
   - Respiratory failure
   - Arrhythmic attacks
   - Airway obstruction (Heimlich maneuver)
4. **Error Analysis**
   Instructors and simulator software provide immediate feedback on student errors.
5. **Development of Clinical Thinking**
   Teamwork, leadership, and communication skills are formed.

III. Main Part

1. Fundamentals of Basic Life Support (BLS)

The BLS algorithm is based on the standards of the **American Heart Association (AHA)** and the **European Resuscitation Council (ERC)**.

1.1. Assessment of an Unconscious Patient

- Ensure scene safety.
- Check the patient's responsiveness ("Are you okay?").
- Assess breathing within 10 seconds.
- Absence of breathing or presence of agonal breathing → initiate CPR immediately.

1.2. Activation of Emergency Medical Services

One student calls emergency services (phone number **103**), while others begin CPR.

1.3. Chest Compressions

- Hand position: center of the chest, lower third of the sternum.
- Rate: **100–120 compressions per minute**.
- Depth: **5–6 cm**.
- Arms straight, elbows locked.
- Allow full chest recoil after each compression.

1.4. Artificial Ventilation

- Compression-to-ventilation ratio: **30:2**.
- Open the airway using the **head tilt–chin lift** technique.
- Provide ventilation mouth-to-mouth or using a mask.

1.5. Use of an Automated External Defibrillator (AED)

- Turn on the AED.
- Correctly place the electrodes on the chest.
- Follow the device's voice prompts.
- After delivering a shock, immediately resume CPR.

2. Development of BLS Skills through Simulation-Based Education

2.1. Types of Simulators

- Adult mannequin
- Pediatric and infant mannequins
- BLS monitor-equipped simulator
- AED trainer
- Airway trainer (airway simulation device)

2.2. Practical Skills Development

Students reinforce the following competencies:

✓ Proper compression depth and rhythm

✓ Mask ventilation technique

✓ AED connection and shock delivery

✓ Algorithmic actions in the absence of breathing and pulse

✓ Team-based performance during resuscitation

2.3. Simulation Scenarios

- Sudden cardiac arrest
- Respiratory failure
- Airway obstruction
- Syncope and loss of consciousness
- Anaphylactic shock–like conditions

Through these scenarios, students learn rapid and effective clinical decision-making in real-life situations.

IV. Conclusion

Simulation-based education in teaching BLS significantly enhances students' practical preparedness and plays a crucial role in saving patients' lives. Correct performance of BLS can increase survival rates by **2–3 times** until emergency medical services arrive.

Therefore, regular simulation training in simulation centers promotes teamwork, rapid clinical thinking, strict adherence to algorithms, and prepares students for real clinical practice.

V. References

1. American Heart Association (AHA). *Basic Life Support Provider Manual*, 2020–2024.
2. European Resuscitation Council (ERC) Guidelines, 2021.
3. World Health Organization (WHO). *Emergency and Critical Care Training Manual*, 2022.
4. Ministry of Health of the Republic of Uzbekistan. *Clinical Protocols for Emergency Medical Care*, 2023.

PRACTICAL TRAINING SESSIONS

Topic 1. Lung Auscultation
Improving Lung Auscultation Techniques Using Simulator Trainers and Learning to Establish Preliminary Diagnoses for Various Diseases

1. Relevance of the topic.

The purpose of auscultation is to hear sounds that occur in the body during the activity of certain organs, based on which a conclusion about health or illness is drawn.

Despite the current successes of medicine, heart failure remains one of the diseases with an unfavorable prognosis for life and disability of patients. Therefore, early detection of heart failure and adequate treatment leads to an increase in the life expectancy of patients and a decrease in the mortality rate. Knowledge of the indications and contraindications for the use of inotropic agents, the dosage regimen, and the management of their effectiveness increases the effectiveness of treatment for this disease.2. Fanlararo va fanlar ichra aloqalar

The study of this topic is based on students' knowledge of the physiology, pathophysiology of the cardiovascular system, propaedeutics of internal diseases, therapy, and clinical pharmacology of drugs. The knowledge gained during the training is used by them in the disciplines of therapy, surgery, obstetrics, and gynecology.

3. Content of the lesson

Theoretical part

The purpose of auscultation is to hear sounds that occur in the body during the activity of certain organs, based on which a conclusion about health or illness is drawn.

Auscultation, or simply speaking, listening to the lungs using tubes, is widely used in diagnosing lung diseases. When a healthy person breathes, a noise called vesicular breathing is heard, which is caused by the movement of the alveolar walls under the influence of air entering through the respiratory tract. This is normal breathing noise for healthy lungs.

In cases of fluid accumulation in the pleural cavity surrounding the lungs, a weakening or even complete disappearance of vesicular breathing is observed due to its obstruction of sound passage.

In the early stages of pleurisy, when no fluid has formed between the pleural layers but is covered with fibrin, a pleural friction rub is heard. When sputum accumulates in the bronchi, the air passing through it causes sounds called wheezing in medicine. Therefore, rales are of particular importance in the diagnosis of diseases associated with the accumulation of sputum and mucus. When the sound of air bubbles passing through the liquid is detected during hearing - these are considered wet wheezes. They are audible in cases of inflammation accompanied by the secretion of a large amount of sputum, rupture of a lung abscess in the bronchial cavity, and external discharge of pus.

In a healthy person, two main breath sounds are heard normally.

♦ Bronchial breathing (laryngotracheal) - audible at the level of the larynx, trachea, and its bifurcation;

♦ Vesicular breathing - heard at the level of lung tissue.

In physiological position, bronchial breathing is heard:

• in the area of the sternal mesentery and its attachment to the body of the sternum;

Posteriorly, in the interscapular region, in the area of the III and IV thoracic vertebrae.

In a physiological state, vesicular breathing is well audible:

On the anterior surface of the chest, below the II rib and outside the frontal sternal line;

In the chest cavity, below the axillary region and the angles of the scapulae, the lung tissue is most densely located.

Vesicular respiration

Types:

physiological weakening or strengthening of vesicular breathing;

pathological weakening or strengthening of vesicular breathing;

absence of vesicular breathing;

Saccadic breathing

Vesicular breathing:

Heard at the level of healthy lung tissue;

The auscultation sound is calm, resembling the "F" sound;

Inhalation-exhalation duration ratio 3:1

Heard on both sides of the chest;

There is no break between inhalation and exhalation;

Puerile breathing can be observed in children from 6 months to 5-7 years of age.

Physiological weakening of vesicular breathing is observed when the chest wall thickens due to excessive muscle development or excessive fat accumulation in the subcutaneous layer.

Physiological intensification of vesicular breathing is observed in individuals with a narrow chest, predominantly asthenic body structure, with poorly developed muscles and subcutaneous fat layer, as well as during physical exertion. Increased vesicular breathing is always heard in children with a thin chest wall and good lung elasticity. This type of breathing is called pueril (from the Latin "rieg" - boys).

Equipment and inventory used during training:

1. Phonendoscope (individual for each person)

2. Simulation Center Cardiopulmonary Auscultation Simulator-Trainer

Changes in vesicular breathing

Character of change	Mechanism	Syndromes or diseases
Decline	1. Barrier syndrome	- hydrothorax - - pneumothorax - - fibrothorax
	2. Decreased elasticity of alveoli	- pulmonary emphysema - early stages of lung tissue inflammation
	3. Obstruction of large bronchi	- obstructive atelectasis
Increased	1. Hyperthermia 2. Hyperthyroidism 3. Physical Exercise	- Unchanged lung tissue under conditions of hyperventilation
Coarsened	Coarsened Bronchial mucosal swelling and bronchial constriction due to exudate, spasm of smooth muscles of small bronchi	- Bronchitis
Saccaded	Uneven narrowing of the smallest	- Tuberculous bronchiolitis

	saccadic bronchioles	- Respiratory disorders due to chest trauma or pathology of the respiratory muscles and their regulation

LUNG AUSCULTATION

1. Purpose: To hear the main and additional breath sounds
2. Clinical significance: mandatory for everyone.
3. Lesson equipment: not required. Must have a volunteer.
4. Algorithm for performing a practical skill:
1. Purpose: To hear the main and additional breath sounds
2. Clinical significance: mandatory for everyone.
3. Lesson equipment: not required. Must have a volunteer.
4. Algorithm for performing a practical skill:

Figure 1. Simulation Center Cardiopulmonary Auscultation Simulator-Trainer

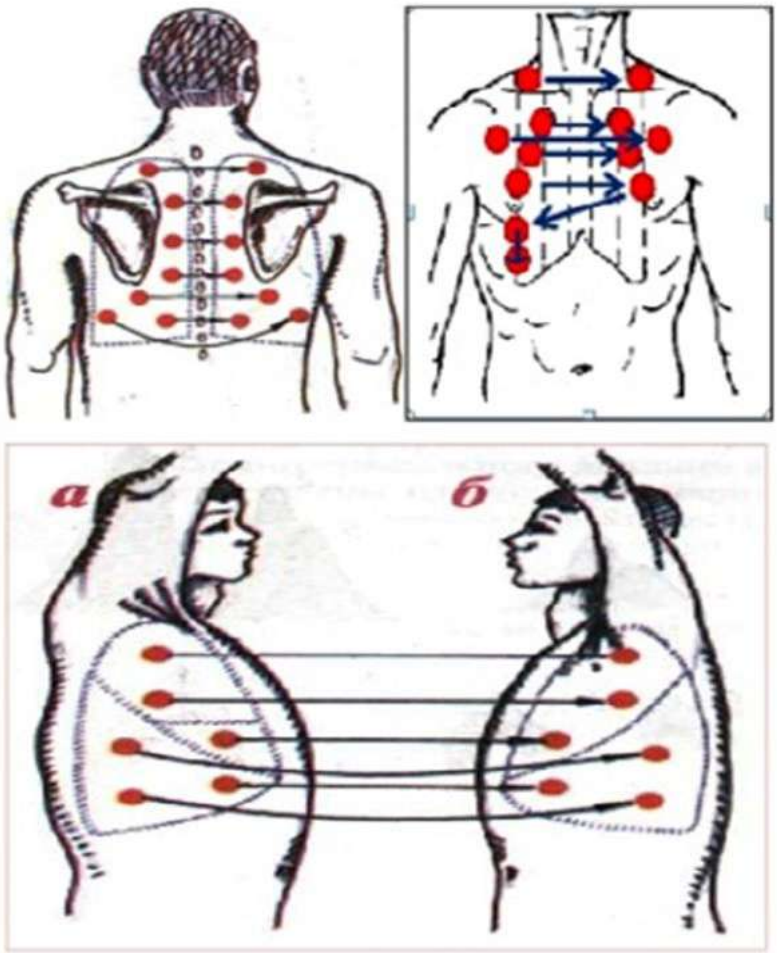


Figure 2. Anterior, posterior, and lateral auscultation points of the lung

№	**Algorithm for Performing the Skil**		
	Anterior lung auscultation	**Perfor med**	**Not performe d**
1	The physician stands in front of the patient. The patient lowers the arms and is asked to take deep breaths through the nose. The diaphragm of the stethoscope is placed first on the right and then on the left supraclavicular areas at symmetrical points. The processes of inspiration and expiration are listened to completely; if possible, 2–3 respiratory cycles are auscultated.		
2	Then the stethoscope diaphragm is placed on the subclavicular areas along **L. parasternalis dextra** and **L. parasternalis sinistra** at symmetrical points. After that, the stethoscope diaphragm is placed on the second intercostal spaces along **L. parasternalis dextra** and **L. parasternalis sinistra** at symmetrical points.		
3	Then the stethoscope diaphragm is placed on the III, IV, and V intercostal spaces along **L. parasternalis dextra** and auscultated. Next, the stethoscope diaphragm is placed on the subclavicular areas along **l. medioclavicularis dextra** and **l. medioclavicularis sinistra** at symmetrical points. Then the stethoscope diaphragm is placed on the second intercostal spaces along **l. medioclavicularis dextra et l. medioclavicularis sinistra** at symmetrical points. After that, the stethoscope is placed along **l. medioclavicularis**		

	dextra on the III, IV, and V intercostal spaces		
Lateral lung auscultation			
4	The physician stands in a comfortable position: on the patient's right side when auscultating the right lung and on the left side when auscultating the left lung. The patient is instructed to raise the arms behind the head.		
5	Then the stethoscope diaphragm is placed along **l. axillaris anterior dextra et sinistra** on the III, IV, V, and VI intercostal spaces at symmetrical points. After that, the stethoscope diaphragm is placed along **l. axillaris media dextra et sinistra** on the III, IV, V, and VI intercostal spaces at symmetrical points.		
Posterior lung auscultation			
6	The physician stands behind the patient. The patient is instructed to lower the arms.		
7	The stethoscope diaphragm is first placed on the area of the VIII cervical vertebra, first on the right and then on the left side, at strictly symmetrical points, and the processes of inspiration and expiration are listened to completely.		
8	Then the stethoscope diaphragm is placed on the suprascapular areas (supraspinous fossae) on the right and left sides at strictly symmetrical points, and the processes of inspiration and expiration are listened to completely.		
9	Then the patient is asked to fold the arms in front of the chest, and the stethoscope diaphragm is placed on the interscapular areas on the right and left sides at strictly symmetrical points.		
10	Auscultation is continued down to the inferior angles of the scapulae; the patient is asked to lower the arms. Then auscultation is performed on the right and left sides along **l. scapularis** at strictly symmetrical points.		

Analytical part

New pedagogical technologies used in the topic:

- "Snowstorm" method.
- "weak organ" game
- solution of situational problems

"Qorbo'ron" usuli.

2. Procedure for using the "Snowstorm" method.

The technique can also be used in the first stages of training. The group is divided into 2 subgroups (SG), and each subgroup of students is recommended to formulate at least 3 questions on the topic and prepare answers.

You are given 6-8 minutes to prepare for the answer. After preparation, the two groups begin to ask each other questions. 1 minute is allocated for the answer, and it is necessary to answer within 1-3 minutes (the time missed is monitored by the teacher). If the group that asked the question is not satisfied with the answer, they will state their answer option. After each "question and answer," the teacher provides an explanation and the correct answer is given. When evaluating the answer, its relevance to the topic, originality, accuracy, relevance (5 points), accuracy, correctness, perfection of the answer (5 points), if one fully states their answer option, an additional score is -1 point, if one adds a little - up to 0.1-1 point, incorrect answer.

Answer analyses are shown in the following form.

Group 1 Group 2

Rate, in points

question number question answer additional question answer additional

During the game, the teacher sums up all the points received by each group and divides the resulting number by 6 (3 questions - 3 answers). The total number is the average score of each group of participants. An active participant is awarded 0.5 points. The passive participant (-0.2, -0.3 points) is subtracted.

Complex of situational problems:

Problem №1

1. The man is 47 years old, claims that his heartbeat has been pausing in recent years. Twice by ambulance, atrial flutter was detected, and they resolved independently.

Objectively: General condition is moderate. Acrocyanosis, cyanosis of the skin, sub-icteric mucous membranes. NOS = 20 min. AQB = 120/80 mm Hg. Pulse 90 beats/min, arrhythmic. The right relative border of the heart is 2 cm beyond the right sternal border, the left relative border is unchanged. Moist rales with small bubbles in the lower parts of the lungs against the background of weakened breathing. Swelling in the legs.

ECG: sinus tachycardia, YucS 104 beats/min., atrial and ventricular extrasystoles, standard I, 2 humped p wave in AVL and V5-6 leads, high R wave in V5-6 leads, segment depression and deep S wave in V1-2 leads are detected.

Questions:

1. Formulate an approximate diagnosis.
2. What additional examinations are needed to confirm the diagnosis?

Problem №2

The man is 52 years old, complaints: shortness of breath after light physical activity, palpitations, chest pain after physical activity, which cannot be eliminated after nitroglycerin intake.

The above-mentioned complaints appeared six months ago after undergoing acute pharyngitis. Objectively: General condition is moderate. Acrocyanosis, pale skin. NOS = 20 min. AQB = 110/70 mm Hg. The heart borders are shifted 3 cm to the left.

Heart sounds are muffled, rhythmic. Moist rales with small bubbles in the lower parts of the lungs against the background of weakened breathing. The liver is located 3 cm below the right costal arch, slightly painful on palpation. Pastosis of the knee and foot is determined.

ECG: Single ventricular extrasystole with sinus rhythm 97 min. Blockage of the anterior branch of the left leg of the Bundle of His. ChqG signs.

Questions:

1. Formulate an approximate diagnosis.
2. What additional examinations are necessary to confirm the diagnosis?

Problem №3

Patient K., 25 years old, applied to the PHC with complaints of shortness of breath, increased physical activity, and dry cough. The day before, she had hemoptysis. Presence of rheumatic fever two years ago.

Objectively: temperature 37.2 C. General condition - moderate. The skin and visible mucous membranes are cyanotic. Vesicular breathing, moist rales not audible in the lower parts of the lungs. NOS 26 min. Palpation of the apex reveals a "cat's wheeze." The relative upper

border of the heart is determined in the second intercostal space. On auscultation at the apex of the heart, the 1st tone is a crackling, diastolic murmur, the accent of the 2nd tone is on the pulmonary artery. Heart rate 110 min. Blood pressure 110/70 mm Hg.

Questions:

1. Your approximate diagnosis.
2. Name the necessary additional tests.
3. List possible complications.
4. Determine your tactics towards the patient, discussing the principles of treatment, prognosis, and prevention of the disease.

Test tasks

1. A more informative examination method for the diagnosis of chronic bronchitis:
-bronchoscopy
- chest X-ray
pulmonary scintigraphy
-blood gas determination
-ECG

2. What is heard on auscultation in chronic bronchitis:
-voiced moist rales
-pleural friction rub
-crepitation
-dry wheezes
-dry and wet wheezes

3. Which group of drugs are not recommended for chronic bronchitis:
-beta-blockers
-immunomodulators
- biostimulants
-bronchodilators
Vitamins

4. Characteristic for croupous pneumonia:
- sudden onset, with tremors
slowly, without trembling
with slowly recurring tremors
- sudden onset, no tremors
-trembling, bradycardia

5. Auscultative phenomenon in the initial stage of croupous pneumonia:
-crepitation indux
moist rales
-dry wheezes
-bronchial breathing
-crepitation reduction

6. The following symptoms are observed in dry pleurisy, indicate the incorrect one:
-acrocyanosis
- chest pain
-dry cough
-excessive sweating
-subfebrile

7. What can be attributed to chest pain observed during coughing and deep breathing in pneumonia:

-spread of inflammatory process to pleura
-exudative fluid accumulation in pleural cavity
-involvement of parenchyma in inflammatory process
-mesenchyme involvement in inflammatory process
-inflammatory process in the upper respiratory tract

8. A non-specific sign of exudative pleurisy:
-strangulation attacks
panting
-superficial breathing
-body temperature elevation
muffled percussion

9. Auscultative phenomenon in the stage of exacerbation-hepatitis in croupous pneumonia:
-bronchial breathing
-depressed vesicular breathing
moist rales
-dry wheezes
-crepitation

10. Common complication of bronchial asthma:
pulmonary emphysema
pulmonary abscess
pulmonary haemorrhage
-bronchiectasis
-exudative pleurisy

11. Ascultative sign of bronchospasm:
-prolonged breathing and dry wheezing
prolonged exhalation and dry wheezing
bronchial breathing
~amphoric breathing
~prolonged exhalation and moist rales

12. Symptom of bronchial asthma
- expiratory dyspnea
- inspiratory dyspnea
- moist rales in the lower parts of the lungs
- liquid foamy sputum
- mucopurulent sputum

Practical part. Pulmonary-cardiac resuscitation
(practical skill)

Methods for assessing skills, abilities, and knowledge
- Oral;
- written;
- organizers;
- test;
- solving situational problems;

- demonstration of acquired practical skills;

Review Questions

1. What are the advantages of listening to pulmonary auscultation in simulators and patients?
2. What are the types of wheezing?
3. What is the concept of bronchial asthma and what are the wheezes?
4. Concept of bronchitis and pneumonia and auscultatory changes.

Topic 2: "Heart Auscultation." Improvement of the technique of performing cardiac auscultation using a simulator-trainer and studying the preliminary diagnosis of various diseases.

1. Relevance of the topic.

The purpose of auscultation is to hear sounds that occur in the body during the activity of certain organs, based on which a conclusion about health or illness is drawn.

Despite the current successes of medicine, cardiovascular diseases remain one of the diseases with an unfavorable prognosis and disability of patients. Therefore, early detection and adequate treatment of cardiovascular diseases leads to an increase in the life expectancy of patients and a decrease in the mortality rate. Knowledge of the indications and contraindications for the use of inotropic agents, the dosage regimen, and the management of their effectiveness increases the effectiveness of treatment for this disease.

2. Interdisciplinary and intradisciplinary connections

The study of this topic is based on students' knowledge of the physiology, pathophysiology of the cardiovascular system, propaedeutics of internal diseases, therapy, and clinical pharmacology of drugs. The knowledge gained during the training is used by them in the disciplines of therapy, surgery, obstetrics, and gynecology.

3. Content of the lesson

Practical training
1. Introduction
2. Theoretical part
3. Analytical part
-Tests and situational problems
4. Practical part

Theoretical part

The purpose of cardiac auscultation is to identify and assess changes in the strength of heart sounds I and II, their pathological division; Third, fourth, and additional heart sounds; detection and assessment of heart-related and heart-independent murmurs.

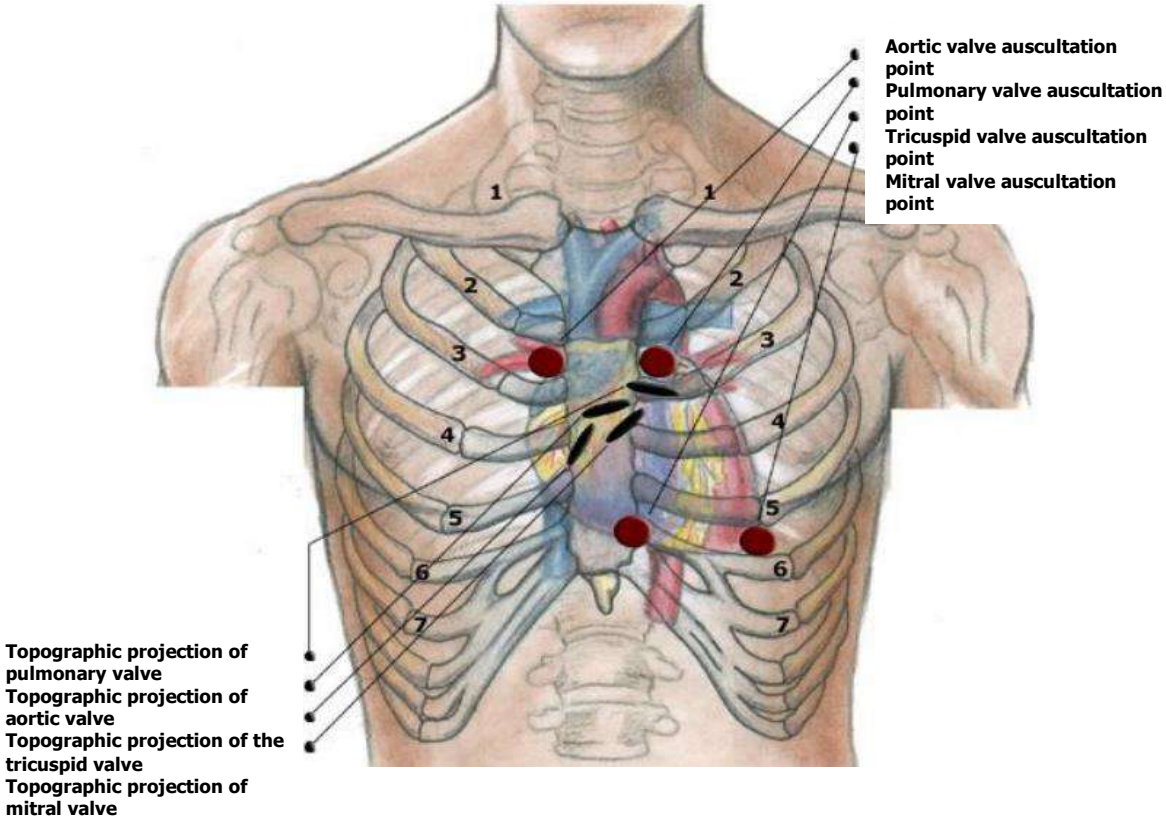
Cardiac auscultation should be performed in a strict sequence (sequentially from point 1 to point 5). Compare the II tone at the 2nd and 3rd auscultation points.

Projections of the heart valves and auscultation points are presented in Table 1, as well as schematically shown in Figure 1.

Table 1. Topographic projections and auscultation points of the heart valves

Heart valves	Topographic location	Auscultation point
Mitral valve	On the left side of the sternum, at the site of attachment of the 3rd costal cartilage	Cardiac apex, 5th intercostal space
Tricuspid valve	On the sternum, midway between the site of attachment of the 3rd left costal cartilage and the site of attachment of the 5th right costal cartilage	Midpoint between the attachment of the 3rd costal cartilage on the left side and the 5th costal cartilage on the right side to the sternum
Aortic valve	In the middle of the sternum, at the site	Midsternal line at the level of the 3rd

Heart valves	Topographic location	Auscultation point
	of attachment of the 3rd costal cartilage	costal cartilages
Pulmonary artery valve	Left side of the sternum, 2nd intercostal space	Projection of the valve on the left side of the sternum in the 2nd intercostal space



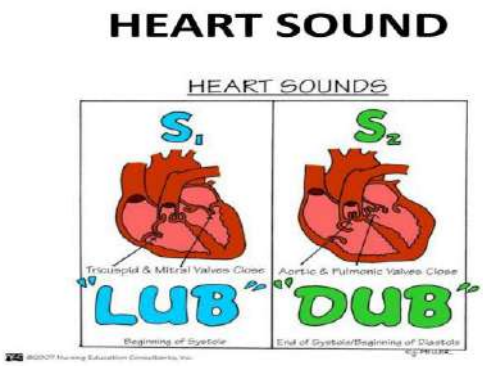
Тұрақ тонаң

During cardiac activity, so-called heart sounds arise. In healthy individuals, two heart sounds are clearly audible during auscultation:

The first tone arises during systole - systolic;

The second tone occurs during diastole - diastolic.

The III and IV heart sounds are also distinguished, but they have low-wavelength oscillations;



The third heart sound is the result of oscillations caused by rapid passive filling of the ventricles with blood during cardiac diastole, 0.12-0.15 minutes after the onset of the second heart sound.

The IV tone occurs at the end of ventricular diastole and is associated with their rapid filling due to atrial contraction.

To better understand the mechanism of heart tone formation, it is necessary to recall its contraction cycles.

During diastole, the pressure in the blood-filled left atrium is somewhat higher than in the emptied left ventricle, and blood flows from the left atrium through the open mitral valve into the left ventricle.

During ventricular systole, their contraction begins, and intraventricular pressure increases compared to left atrial pressure, resulting in the closure of the mitral valve leaflets. During their closure, the first heart sound is formed.

The increase in intraventricular pressure soon leads to its rise even higher than the pressure in the aorta, and the aortic valve leaflets open. In some pathological conditions, the opening of the aortic valve is accompanied by an early systolic "discharge" tone. Normally, with a maximum increase in intraventricular pressure, its value corresponds to systolic arterial pressure.

After the ventricle expels a large amount of blood, its pressure decreases. Pressure in the left ventricle closes the leaflets of the aortic valves after the aorta. As a result, the second heart sound occurs and the next ventricular diastole begins.

Intraventricular pressure decreases during diastole and decreases relative to the pressure in the left atrium. As a result, the mitral valves open. Although this usually occurs silently, in some cases, an opening click is heard in mitral stenosis. Then, during early diastole, the period of rapid filling of the ventricles with blood from the left atrium begins. In children and young people, the third heart sound can be heard during this period. Finally, the fourth heart sound is heard, although not always, sometimes during atrial contractions. Following this, another contraction is observed, i.e., the first tone.

If the above occurs on the left side of the heart, the same condition is observed on its right side, namely the right atrium and ventricle, tricuspid valves, pulmonary artery valves, and the artery itself. Pressure in the right ventricle and pulmonary artery is usually somewhat lower than in the left part of the heart. It should be noted that the above-mentioned processes occur later in the right part of the heart than in the left.

Composition of heart tonic components

Four components are involved in the formation of the first tone, which is heard during systole (systolic).

Two components are involved in the formation of the second tone, and it is heard during diastole (diastolic**).**

I tone:

Occurs during systole after a prolonged diastolic pause;

It is heard better above the apex of the heart, at the point of auscultation of the tricuspid valves - somewhat lower (for example, the systolic tension of the right ventricle is less than in the left);

• At the auditory points of the aorta and pulmonary trunk, it is heard less loudly only due to transmission;

• The first tone is lower and longer than the second tone.

Tone II:

• heard after a short pause during diastole;

It is better heard at the base of the heart, as it is caused by the crackling of the semilunar layers of the aortic and pulmonary valves;

Unlike I tone, it has a shorter duration and a higher audibility. In pathological conditions where the sonority of tones can change, distinguishing the 1st tone from the 2nd helps to match its peak impulse and the pulsation of the carotid artery and aorta.

On auscultation, the heart sounds, appearing behind each other, give a sound reminiscent of the word "Bu-u - tup." In this case, as mentioned above, in normal conditions, the 1st tone is more resonant than the 2nd tone at the apex of the heart and at the base of the xiphoid process, and conversely, the 2nd tone is more resonant than the 1st tone in the 2nd intercostal space to the right and left of the sternum. This can be described as follows.:

In a healthy person, the III and IV tones are faint due to their rare occurrence and are often detected during a phonocardiogram. Sometimes they are detected in children, young people, and thin people. The detection of III and IV tones in elderly people usually indicates severe damage to the heart muscle.

Change of heart tones

chest muscles, pulmonary emphysema, fluid accumulation in the left pleural cavity, and other processes that remove the anterior chest wall from the heart, the resonance of tones decreases. When the conductivity of sound vibrations is improved (thinner chest, contraction of lung edges, proximity of the heart to the anterior chest wall due to a tumor in the posterior chest area, etc.), the resonance of heart tones increases. It also depends on the influence of the large air cavities located near the heart and the composition of the blood flowing through it (the large cavity in the lungs, the large air bubble of the stomach). The resonance of tones increases when the blood viscosity decreases under the influence of cavities and in anemia.

In the diagnosis of heart diseases, it is important to identify changes in heart sounds associated with its own damage.

Weakening of both tones is observed in patients with myocarditis, myocardial dystrophy, acute myocardial infarction, cardiosclerosis, and decreased contractile ability of myocardial muscles due to fluid accumulation in the pericardial cavity.

The intensification of both tones occurs due to the increased influence of the sympathetic nervous system on the heart. This is observed during strenuous physical activity, anxiety, and Graves' disease.

In the diagnosis of heart diseases, a change in one of the tones plays an important role.

Normally, the sonority of the first tone depends on the following factors:

❖ Hermeticity of ventricular chambers during isovolumetric contraction, including the closure density of the atrioventricular valves;

❖ The rate of contraction of ventricular chambers during the isovolumetric period, which, in turn, manifests itself in:

a) the activity and speed of metabolic processes occurring in the myocardium (the ability of the heart muscle to contract);

b) at the magnitude of the ventricular systolic volume: the more filled the ventricle, the slower its contraction rate;

❖ The density of the structures involved in oscillatory movements, primarily the atrioventricular valves;

❖ The position of the atrioventricular valve leaflets immediately before the onset of the isovolumetric contraction period.

Weakening of the first heart sound can be caused by:

• Non-hermetic closure of the atrioventricular valves (for example, mitral or tricuspid valve insufficiency);

• sharp decrease in ventricular contractions as a result of chronic heart failure and acute myocardial damage, increased intraventricular pressure against the background of decreased myocardial contractility;

• Significant decrease in the contractile ability of hypertrophied ventricles, for example, with stenosis of the aortic valves;

In abnormal conditions of the atrioventricular valves immediately before the onset of isovolumetric ventricular contractions.

Increased heart I tone can be caused by:

• An increase in the rate of isovolumetric ventricular contractions, for example, in tachycardia or thyrotoxicosis, an intensification of metabolic processes in the body, including in the heart;

♦ Compression of oscillations and other cardiac structures involved in the formation of the first heart sound, e.g.

Normally, the occurrence of the second tone depends on the following factors:

Hermetic closure of the semilunar valves of the aorta and pulmonary artery;

❖ The speed of closure and vibration of these valves during the protodiastolic period, which, in turn, depends on:

a) the level of blood pressure in the main vessels;

b) the rate of ventricular myocardial relaxation.

❖ The density of the walls of structures participating in oscillatory movements, primarily the semilunar valves and main vessels;

❖ The position of the semilunar valve leaflets immediately before the onset of protodiastole.

The main reasons for the weakening of the second heart sound are:

♦ Disruption of hermetic closure of the semilunar valves of the aorta and pulmonary artery;

• Decreased valve closure rate due to heart failure with a decrease in the rate of ventricular relaxation and a decrease in blood pressure;

• Decreased mobility of the semilunar valves due to their fusion, for example, with stenosis of the aortic valve outlet.

An increase in the second heart sound can be heard both above the aorta and above the pulmonary artery bed. In cases where this tone is more resonant in the aorta, it is called the accent of the second tone in the aorta, and if it is more resonant above the pulmonary artery, it is called the accent of the second tone in the pulmonary artery**.**

Accents of the second heart sound in the aorta are observed in the following cases:

♦ In cases of increased pressure in the aorta (hypertension, severe physical exertion, mental agitation), in which, due to high blood pressure in the aorta at the beginning of diastole, the leaflets of its valves close with great force;

When the aortic valves and their walls become dense (atherosclerosis, syphilitic aortitis, etc.).

Accentuation of the second tone in the pulmonary artery occurs in the following cases:

• sharp increase in pressure in the pulmonary circulation, excessive blood filling of its vessels (for example, mitral heart defects);

• Difficulty of pulmonary circulation and narrowing of the pulmonary artery lumen (pulmonary emphysema, pneumosclerosis, etc.).

Sometimes the timbre of the second tone changes over the aorta; for example, in sclerosis of the aortic valves, it acquires a metallic tone. At the same time, this condition can sometimes be heard even when arterial pressure is normal.

NOISES

In auscultation of the heart, in a number of cases, in addition to tones, sounds called heart murmurs are heard. They are relatively prolonged and arise as a result of turbulent blood flow. Turbulence arises as a result of a violation of the normal ratio of the following three hemodynamic parameters: 1) Valvular orifice and vascular orifice diameter; 2) Blood flow velocity (linear or volumetric); 3) Blood viscosity. Depending on the location of origin, the following types of murmurs are distinguished: "I" - intrakardial; 4" Extracardiac - Identifying and differentiating cardiac murmurs is important in differential diagnosis, as their presence often indicates the presence of heart defects.

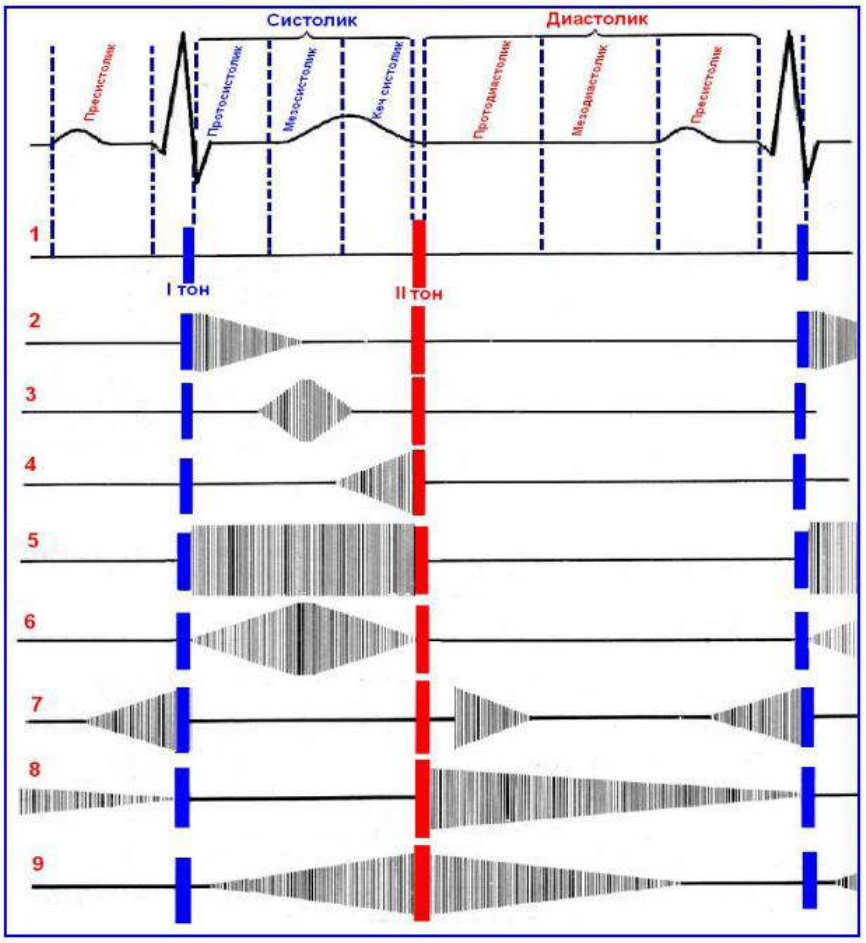


Figure 2. Diagram of some intracardiac murmurs

According to the time of occurrence, the following types of noise are distinguished:

• Systolic murmur;

♦ Diastolic noise.

Systolic murmur occurs when blood narrows in its pathway during systole when moving from one part of the heart to another or to large vessels. In particular, it is observed in stenosis of the aortic arch and pulmonary artery. In these defects, during the ejection of blood from the ventricles, an obstruction appears in the path of blood flow due to vasoconstriction (ejection systolic murmur). Systolic murmur is also heard in mitral and tricuspid valve insufficiency. Its origin is also caused by the return of blood during ventricular systole not only to the aorta and pulmonary artery, but also back to the atria through the incompletely closed mitral orifice (or tricuspid valve orifice) (regurgitation systolic murmur).

Diastolic murmur arises as a result of narrowing of the blood flow pathway during diastole. The retrograde passage of blood from the atria to the ventricles during diastole is heard in heart defects accompanied by the narrowing of the left and right atrioventricular openings. Additionally, in insufficiency of the aortic valves or pulmonary artery, their altered layers do not fully close the opening, causing part of the blood pumped into the blood vessels to return to the ventricles.

CARDIAC AUSCULTATIVE NOISES

Heart murmurs are relatively prolonged sounds that occur during turbulent blood flow. Turbulence occurs when the normal relationship between three types of hemodynamic parameters is disrupted:

1) Diameter of the valve opening and diameter of the vessel lumen;
2) Blood flow velocity (linear or volumetric)
3) Blood viscosity.

Noises heard at the level of the heart and large blood vessels are divided into intracardiac and extracardiac types.

CLASSIFICATION OF CARDIAL NOISES

1. **Intracardial organic murmurs** (organic interventricular or interatrial barrier murmurs caused by gross organic damage to the heart valves and other anatomical structures):
   a) valve damage: acquired heart defects;
   b) defects of the interventricular, interatrial septum, or other congenital defects.

2. Intracardial functional murmurs (functional murmurs are based not on gross violations of anatomical structures, but on dysfunction of the valve apparatus, acceleration of blood flow through anatomically unchanged openings, or a decrease in blood viscosity):

a) relative valve insufficiency or narrowing of the valve orifice;
b) dynamic noises (hypertireoidism, cardiac neurosis);
c) Anemic murmurs (in anemias)**.**

3. Extracardiac murmurs

a) pericardial friction rub
b) rubbing of the pericardium and pleura
c) narrowing of blood vessels
d) vasodilation and aneurysms.

Equipment and inventory used during training:

1. Phonendoscope (individual for each person)
2. Simulation Center Cardiopulmonary Auscultation MATT Simulator-Trainer

CARDIAC AUSCULTATION

1. Purpose: To hear the heart valves
2. Clinical significance: mandatory for everyone.
3. Lesson equipment: not required. Must have a volunteer.
4. Algorithm for performing a practical skill:

CARDIAC AUSCULTATION

No.	Algorithm for Performing the Skill	Performed	Not performed
1	During auscultation, silence must be maintained and the room should be warm.		
2	The patient is undressed to the waist.		
3	Projection areas of the heart valves.		
4	Auscultation is performed with the patient in horizontal and vertical positions and, if necessary, after physical exertion.		
5	Auscultation is also performed during quiet breathing, after maximal expiration, and while breath-holding.		
6	The first auscultation point is the cardiac apex, located in the fifth intercostal space, 1–2 cm medial to the left midclavicular line (mitral valve).		
7	The second auscultation point is the second intercostal space to the right of the sternum (aortic valve).		
8	The third auscultation point is the second intercostal space to the left of the sternum (pulmonary artery).		
9	The fourth auscultation point is at the base of the sternum (tricuspid valve).		
10	The fifth auscultation point is the Botkin–Erb point, located at the junction of the 3rd–4th ribs with the sternum on the left side (aortic valve).		

Complex of situational problems

Problem №1

Patient G., 18 years old, was called home to a doctor who complains of severe shortness of breath and increased heart rate with slight movement. Has been suffering from rheumatism since the age of 6, is registered for dispensary observation. He says he's getting treatment for rheumatism. The deterioration of the condition within 3 days is associated with hyperthermia.

Objective: temperature 37.2 C General condition - moderate. Skin is clean, moderate moisture. Breathing is weakened, moist rales. NOS 30 min. The left border of the heart is determined along the left median scapular line. A rough systolic murmur is heard above the peak, where the 1st tone is weakened. Heart rate 98 beats per minute, rhythmic. Blood pressure 120/70 mm Hg Liver is not enlarged, swelling is absent.

Questions:

1. Your approximate diagnosis

2. Name the necessary additional tests.

3. List possible complications.

4. Define your tactics towards the patient, explain the principles of treatment, prognosis, and prevention of the disease.

5. Show the ECG technique.

Problem №2

The patient, 47 years old, came to the department with complaints of palpitations and weakness. The patient's general condition is moderate. Skin is whitish, moist. Vesicular breathing in the lungs, pronounced muffled heart sounds, heart rate 160 beats per minute, blood pressure 110/70 mmHg. ECG shows signs of myocardial infarction in the anterior septal region of the myocardium, paroxysmal ventricular tachycardia. The attending physician slowly administered 2% lidocaine at 80 mg intravenously. Tachycardia paroxysm was eliminated.

According to the plan, the patient was prescribed lidocaine at 600 mg 3 times a day.

Questions:

1. Your approximate diagnosis
2. Name the necessary additional tests.
3. List possible complications.

Test questions

1. Characteristic for mitral stenosis:
- throbbing heart apex I tone
- accent of tone II in the aorta
- Systolic murmur at Botkin's point
- systolic ureteral murmur
- Diastolic murmur at Botkin's point

2. Auscultation in mitral insufficiency:
- systolic murmur at the apex of the heart and weakening of the first heart sound
- systolic murmur and accent of the second heart sound in the aorta
- systolic murmur at the apex of the heart and amplification of the first heart sound
- systolic and diastolic murmur at the apex of the heart
- weakening of the first heart sound at the apex and diastolic murmur

3. Characteristic of mitral insufficiency:
- coarse systolic murmur at the apex of the heart
- amplification of the first heart sound at the apex of the heart
- quail singing rhythm
- "horse hooves" rhythm
- systolic murmur in the aorta

4. What signs indicate the development of aortic insufficiency against the background of mitral stenosis:
- Diastolic noise at the Botkin-Erb point
- presystolic heart apex murmur
- mitral valve opening tone
- crackling I tone
- increased pulmonary artery tone II

5. Shift of heart borders to the left, weakening of the first heart sound at the apex and the second heart sound in the aorta, diastolic murmur in the aorta, BP: 130/20 mmHg. Which defect are these signs characteristic of:
- aortic insufficiency

- mitral insufficiency
- aortic stenosis
- tricuspidal insufficiency
- mitral stenosis

6. The following are more characteristic of aortic stenosis:
- coarse systolic murmur in the aorta
- systolic capsule at apex
- systolic murmur at apex
- throbbing heart apex I tone
- intensification of the second aortic tone

7. ECG in the acute phase of myocardial infarction:
- high T tooth
- ST segment depression
- ST interval elevation
- deep Q wave
- negative R wave

8. Which sign is most characteristic of transmural myocardial infarction:
- Formation of the QS tooth
- distinct Q tooth
- negative T wave
- Ramplitude decrease
- negative R wave

Topic 3. "Assessment of the patient's emergency condition. Main cardiopulmonary resuscitation. Complications during cardiopulmonary resuscitation. Removal of foreign bodies from the upper respiratory tract (Gamelich's method).

Evaluating the scene

The work of the doctor (first respondent) providing emergency medical care (EMC) does not always begin with the patient himself. An approximate assessment of the state of the scene before providing first aid plays a major role. This assessment is essential for identifying hazardous and interfering factors, ensuring the safety of oneself, the group, witnesses, and the patient, determining the number of patients, finding a safe route to them, determining the mechanism of injury, and gaining a general understanding of the patient.

Main duties of the medical worker who arrived at the scene

- ensure the safety of oneself, one's group, witnesses, and the patient.
- Identify a safe route leading to them.
- assessment of the patient's condition in order to identify a life-threatening condition;
- Additional notification to STYo
- provide assistance based on the results of the inspection
- collection and documentation of the collected data
- call for assistance from employees of other fields if necessary.
- organize the transfer of the patient to a safe place and referral to the hospital.

Assessment of the scene of the incident begins with the following steps:

1. Identification of hazardous and interfering factors
2. Predict how these factors will affect the patient, witnesses, and medical personnel.
3. Taking measures to prevent and reduce these factors

The following types of risk factors can be identified:

- Physical factors (hazardous explosive devices, fire, collapse, heat and cold, electric shock, etc.)

- Toxicological factor (indicators; changes in general condition, odors, dead animals, humans, smoke, warning signs)

- Criminal factor (wounding, terrorist attacks, murder, rape, aggressive patient)

- Infectious factor (rule "tissue isolation of the organism"-strict infectious control, approximately all biological fluids of the patient are affected)

- Psychological factor (the patient or their close person may experience depression, be aggressive, a staff member in criminal situations may experience severe stress as a result of seeing the patient, especially the death of a child, a pregnant woman, or a patient in a severe clinical condition).

When assessing the patient's condition, establishing the right relationship with the patient is of great importance:

1. Establishing and following communication with the patient by looking them in the eye.
2. Positioning slightly below the patient's body during examination.
3. Communicate honestly with the patient.
4. Speak to the patient in a language they understand.
5. Pay attention to the patient's gestures.
6. Speak clearly, slowly, and clearly.
7. Correctly pronounce the patient's full name depending on the situation. Ask the patient what they call him.
8. If the patient's hearing is poor, it is necessary to speak clearly to the patient to understand through lip movements.
9. Before proceeding to the next question, the patient should be given time.
10. One must act calmly and confidently.
11. It is necessary to talk to patients with hearing impairments or who speak another language with the help of an interpreter. Taking measures to prevent and eliminate hazardous factors.

Physical factor - the use of the rule "A deceased or injured ambulance worker cannot help," the call of special forces (firefighter, emergency services (EMS), police, etc.).

Toxicological factor - leaving a windy area, calling an emergency service, not using oxygen devices in the affected area. Criminogenic factor - calling a police officer.

Infectious factor: 1. Ensuring personal safety 2. Washing hands 3. Cleaning, Disinfection, Sterilization 4. Eye protection - special glasses 5. Gloves 6. Jacket or special clothing 7. Face mask.

8 signs indicating an infectious disease:

• High temperature
• Excessive sweating
• Skin and sclera jaundice
• Headache, chest and abdominal pain
• Cough and shortness of breath
• Diarrhea
• Quick fatigue
• Weight loss

Principles of actions in the process of determining the traumatic situation.

• Mechanism of injury - the mechanism of injury is questioned from the patient, witnesses, and family.
• The number of victims will be determined
• If the number of injuries exceeds the capabilities of the medical team, then work is carried out on the principle of providing assistance to those with multiple injuries.
• Before direct contact with the patient, it is necessary to call additional forces: police, ambulance, rescuers, firefighters.
• Start medical screening
• If the arriving team manages the incident, continue to immobilize the spine, ensure its safety, and provide assistance.

Legal aspects of emergency assistance:

- Consent and firm consent - an adult patient agrees to the assistance provided to them when they are conscious. You must get permission!
Contemplated consent - when the patient is physically or mentally unable to consent to the provision of assistance.
- If there are young children and intellectually disabled people - to obtain consent, it is necessary to find parents or a breadwinner.
- The provided consent enters into force upon detection of a life-threatening circumstance. Denial
- The patient has the right to refuse in cases of preservation of common sense and consciousness. ..
- Aggression - when you give the patient a condition that causes harm or fear. - Offensive action - touching the patient without their consent.
- Disruption of the sequence of actions to leave the patient mentally and consciously.

Subsidiary legal aspect

- Forced action
- Calmness

Cold-bloodedness is a superficial attitude towards one's work, employees, the place, and the patient.

• Emergency Medical Assistant Blind Delay of Compulsory Care
•

Emergency Medical Care
failure to provide full support according to staff standard
• Patient injured
• Injury to a patient as a result of providing non-standard care.
Leave - Patient
Termination of emergency medical care while under emergency medical supervision.

PRINCIPLE OF PATIENT CONDITION ASSESSMENT

The general opinion of the patient depends on the surrounding environment and the patient's complaints.
Determine what kind of disease the patient has, i.e., whether it is somatic or traumatic, and if the patient is traumatic, quickly determine whether mechanical damage was caused.
- Age
- Jeans
- Ethnic origin
- Assessment of the patient's condition, prevention of danger to their life.
- If his life is in danger, he needs to be provided with emergency medical care.
- Assessment of the origin and mechanical effects of the disease. Mechanical impact is indicated in the following cases:
- Departure from transport
- Vehicle death
- Falling from a height of 2.5 meters
- Rolling off the roof of a vehicle
- High-speed collision of vehicles
- Vehicle hitting pedestrian
- Motorcycle accident
- Absence or impairment of consciousness
- A penetrating wound to the head, chest, and abdomen.
- Closed wounds.
- Auxiliary belt o If the belt is not worn, it can cause injury. o If the patient is wearing a belt, it should not be assumed that the patient was not injured.
- Auxiliary pillows An auxiliary pillow may be useless if the belt is not fastened. b. After the pillow tilts, the patient may be in a state where they hit the steering wheel. c. It is necessary to remove the pillow and check the condition of the steering wheel.

- Fall from a height of more than 3 meters
- Injury while riding a bicycle
- Average number of vehicles

Patient Status Assessment Report

According to standard procedures, primary and secondary ABCDE assessment, indicating the patient's condition requiring assistance, is conducted in conjunction with ABCDE assistance. Familiarization with the patient (verbal influence) Engaging in communication with the patient, introducing yourself, informing the patient that you are an emergency medical service specialist and that you have come to provide them with immediate assistance. After obtaining his consent, you can provide him with emergency medical care.

PRIMARY ASSESSMENT

STEP A - ENSURING RESPIRATORY TRACT CONDUCTIVITY.

- Is the patient in consciousness - is the patient talking or crying?
- If yes, it is necessary to check the patient's respiratory tract.
- If not, it is necessary to restore the respiratory tract of the lungs.
- For somatic patients, the patient is seated, the head is pulled back, the chin is raised.
- For traumatic patients or patients with unclear conditions, it should be carried out in a stabilizing and immobilizing position with the middle part of the cervical spine and lower jaw raised. It is necessary to place the neck fixator.

STEP B - RESPIRATORY ASSISTANCE AND RESPIRATORY EVALUATION

- If the patient's respiratory tract is not disturbed and they are conscious, oxygen supply is sufficient.
- For all patients who are not breathing independently, or if there are breathing problems, a higher volume of oxygen should be administered (at least 15l through a mask with a single-way valve).

If the patient does not have breathing, it is necessary to restore the airways and maintain them in a stable state.

With artificial lung ventilation (ALV), it is necessary to use additional respirator guidelines. Providing oxygen is necessary in all situations.

Connect the pulse oximeter sensor and assess oxygen saturation.

STEP C - BLOOD CIRCULATION ASSESSMENT AND HEMODYNAMIC SUPPORT

- Pulsation assessment - assessment of the patient's blood circulation, palpation of the pulse in the central and peripheral arteries.

If the patient is older than 1 year, their central pulse can be felt in the carotid artery.

If the patient is less than 1 year old, the central pulse can be palpated on the brachial artery.

- If the patient is less than 1 year old, the peripheral pulse can be determined by palpating the heel or by a capillary test.

If the patient is over 1 year old, the peripheral pulse can be palpated on the radial artery.

- If the central pulse stops, external cardiac massage is necessary.

It is necessary to assess the volume of external bleeding and, if bleeding occurs, use the rules for stopping it. It is necessary to assess the pulse rhythm by connecting the cardimonitor to the patient.

STEP E - ASSESSMENT OF THE PATIENT'S CONSCIOUSNESS.

If the patient responded to verbal influence at step A, then simple questions should be asked (what does he know about himself, what time is it? What's your name? What day is it today? What happened?

If the patient responded to verbal stimulation without responding to step "A," it is necessary to check the pain reaction.

1. level of consciousness 2. Consciousness is oriented 3. Consciousness is disoriented 4. Response to verbal and tactical influences. 5. Response to pain. 6. Unconscious state - absence of vomiting and cough reflexes

- If there is no pulse in the central artery, but there is ventricular tachycardia or ventricular fibrillation on the cardiac monitor,

- electrodefibrillation.

STEP F - QUICK EXAMINATION OF THE ENTIRE BODY OF TRAUMATIC PATIENTS BY TRAUMATOLOGICAL AND PHYSICAL METHODS.

- If the number of patients is more than 1 patient, their placement according to the direction of the disease.

ENSURING RESPIRATORY TRACT CONDUCTIVITY.

Obstruction of the respiratory tract can be caused by foreign bodies (blood, vomit, mucus, tongue root). In most cases, the root of the tongue touches the posterior wall of the pharynx (when the tone of the mandibular and cervical muscles, which hold the root of the tongue above the posterior wall of the pharynx, is lost, the tongue falls under its own weight and touches the posterior wall of the pharynx).

This prevents valve-like air entry during breathing in patients in a comatose state. When a foreign body (kabob, piece of fruit, etc.) enters the airways, it can cause laryngospasm and bronchospasm.

If the airway obstruction is partial, noisy stridoric breathing is heard, and accessory muscles (intercostal muscles, neck muscles) are involved in breathing.

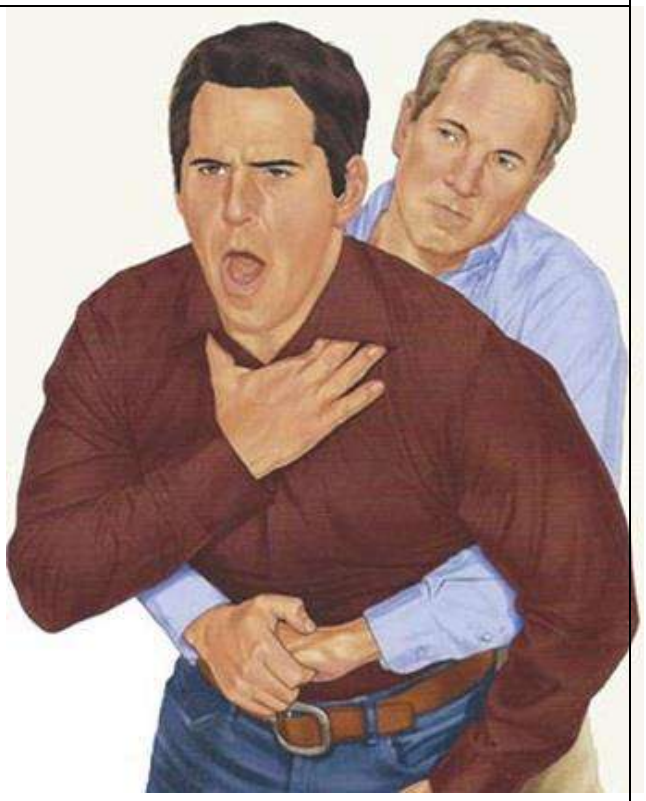
In complete obstruction, with active respiratory movements, air does not enter and exit the lungs, and if the foreign body is not removed, this leads to the cessation of breathing and then cardiac arrest. Obstruction can be the cause of the patient's death.

The triple method of travel leads to the opening of the airways (stretching the head back from the occipito-cervical joint, raising the lower jaw forward and upward, opening the mouth and cleaning the mouth from foreign bodies):

1. Straightening the head backward from the occipitocervical joint. With the palm of one hand, press the patient's forehead, turn the head back as far as possible, and with the other hand, raise the neck from below. Remember! Trauma to the cervical spine is contraindicated for turning the head back (due to the possibility of spinal cord injury).
2. Raising the lower jaw forward and upward is performed by gripping the lower jaw or the corners. When lifting the jaw, the upper and lower teeth should be in the same plane.
3. Open the mouth. To make sure there are no foreign bodies in the airways (be sure). If suspicion arises, the oral cavity should be cleaned with a pacifier; if there is a foreign body, try removing it with your fingers (try removing the foreign body by inserting the index finger into the pharynx, up to the base of the tongue, resembling a hook, or by inserting the index and middle fingers resembling tweezers). If it is not possible to remove the foreign body, the patient is laid on their side and several times struck with the palm behind them (between the shoulder blades), then the foreign body is removed.

After ensuring airway patency, the patient's lungs are inhaled 2-3 times. If chest excursion is not observed in this case, it can be suspected that the airways are blocked by a foreign body. An attempt can also be made to remove the foreign body by pressing the abdomen or lower parts of the chest (in the Heimlich method) (by pressing the lower part of the chest or upper part of the abdomen 3-4 times, an artificial cough is induced). This procedure should be performed with caution, as risky movements can lead to complications such as liver, stomach rupture, and regurgitation. If laryngoscopy is possible, the foreign body is removed and intubated. If tracheal intubation is not possible, tracheostomy or conicotomy can be performed.

EMERGENCY ASSISTANCE FOR IODINE BLOCKING IN THE RESPIRATORY TRACT

	Blockage of the respiratory tract by foreign bodies is a dangerous condition, which can be observed mainly during food preparation and in young children when playing with small objects. If the airways are partially blocked - suddenly a strong cough and shortness of breath appear. If the airways are completely blocked - an adult clutches their neck with their hands, a young child becomes speechless, quickly turns pale, then turns blue, and loses consciousness without timely help.
Heimlich maneuver. First aid: if partial blockage occurs - bend the body forward and ask to cough until the iodine enters. If completely closed - take measures to clean the mouth with your finger. The back of the chest is struck several times with the palm. If breathing is not restored, the Heimlich maneuver is immediately performed, i.e., by passing through the back and firmly squeezing the lower part of the chest with both hands, the iodine is released.	
If the victim is lying down - the method of removing the iodine.	Assistance provided if a child under one year of age is clogged with iodine particles.

Assistance provided if a child over one year of age is clogged with iodine particles.

Cardiopulmonary resuscitation

First aid should be provided as soon as possible after the incident.

Indications for performing Cardiopulmonary resuscitation:

* Absence of consciousness and normal breathing;

* in cases of severe bleeding, electrical injury, drowning, collapse, cardiac arrest, and a number of other cases, first aid must be provided immediately, without delay.

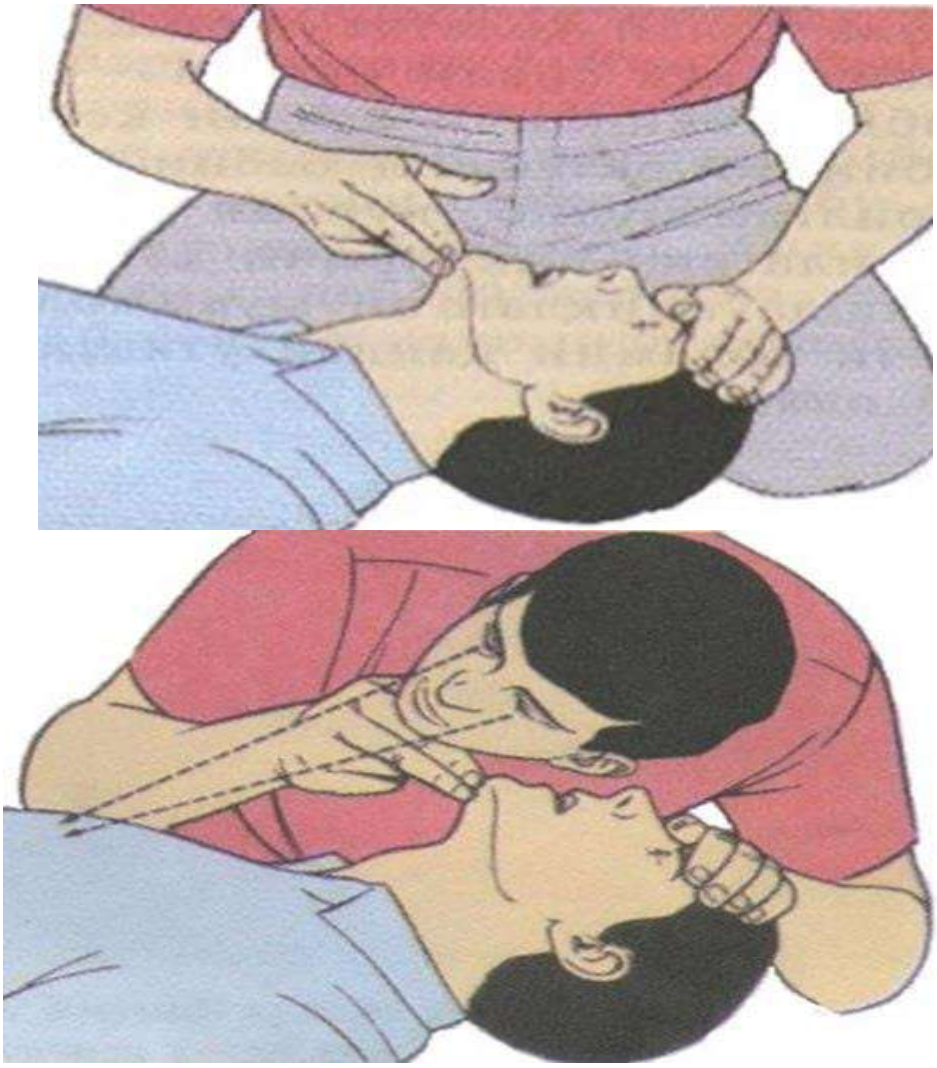
Contraindications for performing pulmonary heart resuscitation:

- Presence of clear signs of biological death;
- Non-viable injuries;
- Terminal stage of illness with low probability of recovery
- Threat to the life of the person providing assistance (the person conducting the CRP)

The following equipment should be prepared for performing pulmonary heart resuscitation:

No.	Step-by-step stages	Completion status	
		Performed	Not performed
1	Ensure safety (your own safety, the victim's safety, and the safety of bystanders).		
2	Check the victim's responsiveness (ask loudly "Do you need help?", gently shake the victim by the shoulders).		
3	Open the victim's airway (tilt the head backward).		
4	Check breathing (bring your ear close to the victim's mouth, listen, feel, and observe chest movements) – should not exceed 10 seconds.		
5	If breathing is absent or not normal, ask an assistant to call emergency medical services or call yourself. The emergency medical service phone number is **103**. If you are alone, use the loudspeaker mode while simultaneously starting CPR.		
6	Perform 30 chest compressions (depth 5–6 cm, rate 100–120 per minute). (The pause between compressions should not exceed 10 seconds). Continue compressions continuously.		
7	Provide 2 rescue breaths, one breath every 5 seconds. Use barrier protective devices for ventilation (valve devices, special masks for artificial ventilation).		

picture 1. Open the victim's airways and tilt their head back.



picture 2. Check breathing

picture 3. Chest compressions 30 times

picture 4. Giving 2 rescue breaths

CONTROL QUESTIONS

1. What indicators should be paid special attention to when assessing acute conditions in patients?
2. What causes impaired airway patency?
3. Define the concept of asphyxia.
4. What are the stages of first aid for airway patency disorders?
5. Define asthmatic status.
6. What is included in the first aid algorithm for a bronchial asthma attack?
7. What are the principles of basic pulmonary heart resuscitation?
8. What are the indications for performing basic pulmonary resuscitation?
9. In what order is the game-lix method conducted?
10. How is the travel method implemented?
11. What are the most common emergency situations?

Describe the conditions for performing basic pulmonary heart resuscitation.

Independent Study Materials

Independent study (IS)	**Hours**
1	First aid in an acute attack of bronchial asthma
2	Classification of burns, degrees, and first aid algorithm
3	Etiology and classification of stroke and first aid algorithm in stroke
4	Etiology and classification of myocardial infarction and first aid algorithm
5	First aid algorithm in acute cholecystitis
6	First aid in hyperthermia syndrome in children
7	Assessment of reflexes in newborns
8	Physical examination in newborns
9	Cardiopulmonary resuscitation in children
10	Obstructive syndrome in children
Total	**15**

Talabalar mustaqil ishi uchun tavsiya etilgan darsliklar va o‘quv qo‘llanmalar ro‘yxati

Asosiy adabiyotlar:

1. Ichki kasalliklar propedevtikasi. Gadayev A.G., Karimov M.SH. T. 2012.
2. UAV uchun amaliy ko‘nikmalar to‘plami. Gadayev A., Axmedov X., Toshkent 2014.
3. Sbornik prakticheskix navikov dlya vrachey obshey praktiki. Prakticheskoye rukovodstvo. A.Gadayev, X.Axmedov. 2010.
4. Kriticheskiye i neotlojniye sostoyaniya v meditsine. Vayman M.A., Avakov V.YE. Moskva. “VECHE”. 2003.
5. Sestrinskiy uxod v terapii s kursom pervichnoy meditsinskoy pomoshi. Uchebnoye posobiye. Smoleva E.V. Rostov-na-Donu “Feniks”. 2019.
6. Shoshilinch holatlar. Darslik. J.M.Sobirov, SH.E.Otaxonov, A.Z.Gaziyev, A.G.Parpiyev. Toshkent “Yangi asr avlodi”. 2006.

Qo‘shimcha adabiyotlar:

1. Shoshilinch holatlar. Darslik. Tez tibbiy yordam. O.Eshonov. “Tafakkur” nashriyoti. Toshkent-2019.
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3. Osnovi uxoda za xirurgicheskimi bolnimi [Elektronniy resurs] : uchebnoye posobiye / Gluxov A.A., Andreyev A.A., Bolotskix V.I. - M. : GEOTAR-Media, 2015. http://www.studmedlib.ru/book/ISBN9785970432167.html
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6. Pervaya meditsinskaya pomosh [Tekst]: programma osvoyeniya prakticheskix umeniy na pervom kurse vsex fak.: ucheb.-metod. posobiye / M-vo zdravooxraneniya i sotsial. razvitiya Ros. Federasii, Kazan. gos. med. un-t, Sentr prakt. umeniy, Kurs anesteziologii i reanimatologii kaf. xirurg. bolezney № 1; [sost.: S. A. Bulatov i dr.]. - Kazan: KGMU, 2005. - 71.
7. Obshaya xirurgiya [Elektronniy resurs]: uchebnik / Petrov S.V. - 4-ye izd., pererab. i dop. - M.: GEOTAR- Media, 2016.
8. First Aid in Case of Accidents and Emergency Situations [Elektronniyresurs]: Preparation Questions Preparation Questions for a Modular Assessment / Levchuk I.P., Kostyuchenko M.V. - M.: GEOTAR-Media, 2015.
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11. Osnovi sestrinskogo dela. Situasionniye zadachi [Elektronniy resurs] : uchebnoye posobiye dlya meditsinskix uchilish i kolledjey / Morozova G.I. - M. : GEOTAR-Media, 2013. http://www.studmedlib.ru/book/ISBN9785970424001.html
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http://www.studmedlib.ru/book/ISBN9785970424001.html

Internet saytlari:

1. https://lms.can-health.org - dunyoda chop etilgan tibbiy ma'lumotlar bazasi
2. https://www.rusnrc.com/
3. http://e.kazangmu.ru/moodle/course/view.php?id=1193

GLOSSARIY

Term	Explanation
Arterial blood pressure	Measurement of systolic (maximum) and diastolic (minimum) blood pressure; in emergency conditions, a sharp decrease is a sign of shock or collapse. In children, it is calculated according to age using the formula (systolic = 90 + 2p, diastolic = 60 + p, where p – age).
Asphyxia	Suffocation resulting from an acute cessation of oxygen delivery to body tissues; life-threatening. Causes include mechanical airway obstruction, gas poisoning, or cerebral circulatory disorders. First aid: removal of the obstruction, oxygen therapy, and artificial ventilation.
Arrhythmia	A condition characterized by unequal intervals between pulse beats; a disturbance of heart rhythm. In emergency situations, a physician must be notified immediately.
Automated External Defibrillator (AED)	A device that provides defibrillation and CPR instructions; applies electrical current to terminate cardiac fibrillation.
Indirect cardiac massage	Ensuring blood circulation by compressing the chest; the main component of CPR, performed at a rate of 100–120 compressions per minute with a depth of 5–6 cm.
Bronchial asthma attack	Shortness of breath caused by narrowing of small bronchi and mucus plugging; accompanied by wheezing and sputum production. First aid: place the patient in a sitting position, provide inhalation therapy, and call a physician.
Defibrillation	Application of electrical current to restore heart rhythm; indicated in fibrillation and asystole.
Heimlich maneuver (abdominal thrusts)	Pressure directed to the abdominal cavity to remove a foreign body from the upper airway; performed by delivering thrusts to the upper abdomen with a fist. In unconscious patients, it is used in combination with chest compressions.
Hypothermia	Decrease in body temperature (below 35°C); observed in emergency conditions such as shock or respiratory failure. First aid: keep the patient in a warm environment and provide warming.
Clinical death	Absence of consciousness, breathing, and pulse; a state between life and death. CPR must be started immediately, as the brain can survive without oxygen for 4–6 minutes.

Appendices
- **Module program**
- **Syllabus**
- **Handout material**
- **Tests**
- **Assessment criteria**

MINISTRY OF HIGHER EDUCATION, SCIENCE AND INNOVATIONS OF THE REPUBLIC OF UZBEKISTAN

MINISTRY OF HEALTH OF THE REPUBLIC OF UZBEKISTAN

TASHKENT STATE MEDICAL UNIVERSITY

" APPROVED"
Rector of Tashkent State Medical University Sh.A. Boymuradov
_____
20___ "____"_____

Registered:
№ _ Bachelor's degree_____
_D-60910200-2.03____

MODULE PROGRAM ON SIMULATION TRAINING
(elective)

Field of knowledge:	900 000 –	Health care and social affairs
Field of education:	910 000 –	Healthcare
Direction of education:	60910200 –	General medicine

Toshkent -2025

Course / Module Code	Academic year	Semester	ECTS- credits
SO‘2601	2025/2026	6	1
Course / Module type	**Language of instruction**		**Weekly class hours**
Elective	English		6

1.	Course / Module name	Classroom hours	Lectures (hours)	Independent study (hours)	Total workload (hours)
	Simulation-Based Education	11	4	15	30

2.

Course Content

The purpose of teaching the course is to improve students’ competencies in organizing safe medical care, to strengthen and deepen the knowledge and skills acquired during the educational process, and to stimulate students’ creative development.

The objectives of the course are to teach emergency medical care skills in frequently encountered situations using modern simulators; to conduct training on innovative interactive applications (in outpatient and hospital settings); and to teach modern diagnostic and treatment standards using interactive panels.

II. Main Theoretical Section

II.I. The course includes the following lecture topics:

1. Simulation-Based Education: Diagnostic methods for pulmonary and cardiac diseases.
2. Simulation-Based Education: Basic cardiopulmonary resuscitation.

II. Guidelines and Recommendations for Practical Training

The following topics are recommended for practical training sessions:

1. Lung auscultation. Improving lung auscultation techniques using simulator trainers and learning to establish preliminary diagnoses for various diseases.
2. Cardiac auscultation. Improving cardiac auscultation techniques using simulator trainers and learning to establish preliminary diagnoses for various diseases.
3. First aid in various acute conditions. Assessment of emergency conditions in patients. Basic cardiopulmonary resuscitation. Complications during cardiopulmonary resuscitation.

Practical training sessions are conducted separately for each academic group in classrooms equipped with multimedia devices. Active and interactive teaching methods are applied, including **project-based learning**, **case study**, and other technologies. Handout materials and information are delivered using multimedia tools.

IV. Practical Skills

1. First aid algorithm in hypertensive crisis
2. Cardiopulmonary resuscitation in children
3. First aid algorithm in broncho-obstructive syndrome
4. Ischemic heart disease: first aid algorithm in myocardial infarction. ECG diagnostics
5. First aid in seizure attacks

V. Independent Study and Independent Work

Recommended topics for independent study:

	1. First aid in an acute attack of bronchial asthma 2. Classification of burns, degrees, and first aid algorithm 3. Etiology and classification of stroke and first aid algorithm in stroke 4. Etiology and classification of myocardial infarction and first aid algorithm 5. First aid algorithm in acute cholecystitis 6. First aid in hyperthermia syndrome in children 7. Assessment of reflexes in newborns 8. Physical examination in newborns 9. Cardiopulmonary resuscitation in children 10. Obstructive syndrome in children **Forms of Recommended Independent Work** - independent study of selected theoretical topics using educational literature; - preparation of reports (essays) on assigned topics; - preparation of presentations on assigned topics; - application of theoretical knowledge in practice; - work with automated teaching and assessment systems; - independent development of graphic organizers and reinforcement of knowledge using them; - preparation of scientific articles and conference presentations, etc. **General Guidelines for Organizing Independent Study** Independent work for the course is conducted outside the classroom. Students prepare essays, reports, presentations, and graphic organizers on recommended topics and submit them to the instructor outside class hours. The submitted work must comprehensively address the topic questions, with emphasis on the medical relevance of the topic. The completed work should be up-to-date, contain new scientific information, and be enriched with animations and video materials.
3.	**VI. Learning Outcomes of the Course (Formed Competencies)** As a result of mastering the course, the student: • **has knowledge** – provides emergency care in frequently encountered situations (therapy, pediatrics, and resuscitation); – is able to correctly assess the condition of the simulator (patient), collect medical history, interpret laboratory and instrumental diagnostic data related to examination, treatment, and prevention. • **knows and is able to apply skills** – interprets auscultation findings and laboratory parameters; understands modern methods of treatment and prevention of internal organ diseases. • **possesses practical competencies** – – objectively and subjectively evaluates the patient's condition based on complete and accurate history taking; – develops clinical reasoning when establishing diagnoses; – provides first aid in myocardial infarction; – provides first aid in seizure attacks.
4.	**VII. Educational Technologies and Methods** • Interactive games; • Seminars (logical thinking, rapid question–answer sessions);

	• Group work; • Presentation-based teaching; • Individual projects; • Team-based projects and defenses.
5.	**VIII. Requirements for Earning Credits** Full mastery of theoretical and methodological concepts of the course, correct interpretation of analysis results, independent reasoning on studied processes, completion of assigned tasks, and successful completion of written/oral and test-based interim and final assessments.
6.	**Main literature** 1. UAV uchun amaliy ko‘nikmalar to‘plami. Gadayev A., Axmedov Kh., Tashkent 2014. 2. Сборник практических навыков для врачей общей практики. Практическое руководство. А.Гадаев, Kh.Ахмедов. 2010. 3.Критические и неотложные состояния в медицине. Вайман М.А., Аваков В.Е. Москва. “ВЕЧЕ”. 2003. 4. Сестринский уход в терапии с курсом первичной медицинской помощи. Учебное пособие. Смолева Э.В. Ростов-на-Дону “Феникс”. 2019. 5. Шошилинч ҳолатлар. Дарслик. Ж.М.Собиров, Ш.Э.Отахонов, А.З.Газиев, А.Г.Парпиев. Тошкент “Янги аср авлоди”. 2006. **Additional literature** 6. Shoshilinch holatlar. Darslik. Тез тиббий ёрдам. O.Eshonov. “Tafakkur” nashriyoti. Toshkent-2019. 7. Обший уход за больными терапевтического профилья [Электронний ресурс]: учеб. пос. / Ослопов В. Н., Богоявленская О. В. - М.: GEOTAR-Media 2015. – http://www.studmedlib.ru/book/ISBN9785970433935.html 8. Основи ухода за хирургическими больними [Электронний ресурс] : учебное пособие / Глухов А.А., Андреев А.А., Болотских В.И. - М. : ГЕОТАР-Медиа, 2015. http://www.studmedlib.ru/book/ISBN9785970432167.html 9. Симуляционное обучение в медицине [Электронный ресурс]: учеб. пос. / Под редаксией профессора Свистунова А.А. - М.: ROSOMED, 2013. - http://www.studmedlib.ru/book/ISBN9785970433935.html 10. Программа освоения практических умений по методике “стандартизированний патсиент” [Электронний ресурс] / Булатов С.А., Хамитов Р.Ф. - Казан: Казанский ГМУ, 2006. - http://www.studmedlib.ru/book/skills-2.html 11. Первая медицинская помощ [Текст]: программа освоения практических умений на первом курсе вцех фак.: учеб.-метод. пособие / М-во здравоохранения и социал. развития Рос. Федерации, Казан. гос. мед. ун-т, Сентр практ. умений, Курс анестезиологии и реаниматологии каф. хирург. болезней № 1; [сост.: С. А. Булатов и др.]. - Казан: КГМУ, 2005. - 71. 12. Обшая хирургия [Электронний ресурс]: учебник / Петров С.В. - 4-е изд., перераб. и доп. - М.: ГЕОТАР- Медиа, 2016. 13. First Aid in Case of Accidents and Emergency Situations [Електроннійресурс]: Preparation Questions Preparation Questions for a Modular Assessment / Levchuk I.P., Kostyuchenko M.V. - М.: ГЕОТАР-Медиа, 2015. 14. Скорая медицинская помощ [Электронний ресурс] / Верткин АЛ. - М.:

	ГЕОТАР-Медиа. http://www.studmedlib.ru/book/IGTR0001.html 15. Медицинские манипуляции [Электронний ресурс] / Марк Стоунхем, Джон Вестбрук. - М. : ГЕОТАР- Медиа, 2011. 16. Основи сестринского дела. Ситуационние задачи [Электронний ресурс] : учебное пособие для медицинских училищ и колледжей / Морозова Г.И. - М. : ГЕОТАР-Медиа, 2013. http://www.studmedlib.ru/book/ISBN9785970424001.html 17. Основи сестринского дела: Алгоритми манипулятсий [Электронний ресурс] : учебное пособие / Н.В. Широкова и др. - М. : ГЕОТАР-Медиа, 2012. http://www.studmedlib.ru/book/ISBN9785970416051.html. 18. Ситуационние задачи [Электронний ресурс] : учебное пособие для медицинских училиш и колледжей / Морозова Г.И. - М. : ГЕОТАР-Медиа, 2013. http://www.studmedlib.ru/book/ISBN9785970424001.html **Internet saytlari:** 1. https://lms.can-health.org - dunyoda chop etilgan tibbiy ma'lumotlar bazasi 2. https://www.rusnrc.com/ 3. http://e.kazangmu.ru/moodle/course/view.php?id=1193
7.	**Responsible Persons for the Course / Module** **Parpibayeva D.A.** – Head of the Department of Clinical Modeling, DSc, Associate Professor **Salayeva M.S.** – Department of Clinical Modeling, Associate Professor **Salimova N.D.** – Department of Clinical Modeling, Associate Professor
8.	**Reviewers** **Internal reviewer:** Nabiyeva D.A. – Head of the First Department of Faculty and Hospital Therapy and Occupational Pathology, Professor, DSc **External reviewer:** Abdurakhimova L.A. – Professor, Tashkent International University of Chemistry, DSc
9.	**Approval** The course syllabus was approved by Order No. **1328** dated **05.06.2025** of Tashkent State Medical University (Appendix 3 to the order). **Head of the Educational and Methodological Department** F.Kh. Azizova **Dean of the 1st Faculty of General Medicine** I.A. Otajonov **Dean of the 2nd Faculty of General Medicine** A.A. Irnazarov

MINISTRY OF HIGHER EDUCATION, SCIENCE AND INNOVATIONS OF THE REPUBLIC OF UZBEKISTAN

MINISTRY OF HEALTH REPUBLIC OF UZBEKISTAN

TASHKENT STATE MEDICAL UNIVERSITY

"APPROVED"
Tashkent State Medical University
Vice-rector on educational work
Q.N.Khaitov
_____
2025 year «____» _____

SIMULATION TRAINING
SYLLABUS ON THE SUBJECT
For the daytime department (3 course)

Knowledge Area:	900 000	– Social welfare and health care
Field of study:	910 000	– Health Care
Education Area:	60910200	– Medicine

Toshkent -2025

SIMULATION TRAINING
SYLLABUS OF SUBJECT
Davolash fakulteti

60910200- Therapeutic education

Full module title:	**Simulation training**
Status of the training module	**Elective**
Module code:	**SO‘2702**
Year:	**2025/2026**
Semestr:	**5-6**
Form of education:	**daytime**
Course format and hours allocated per semester:	**30**
Lecture	**4**
Practical training	**15**
Laboratory training	**-**
Seminar	**-**
Independent education	**15**
Credit amount:	**2**
Evaluation form:	**Trial**
Science language:	**Uzbek, Russian and ingliz**

Purpose of the subject (PS)	
PS1	The aim is to improve the skills of students in organizing safe medical care, consolidate and deepen the knowledge and skills acquired during the educational process, and stimulate the creative growth of students.

Basic knowledge necessary for mastering science	
1.	**Introduction to Medicine**
2.	**Human Anatomy**
3.	**Propediology of Internal Medicine**
4.	**Children's Diseases**
5.	**Internal Medicine**
6.	**Pharmacology**

Learning Outcomes (LO)
(Learning outcomes are formulated taking into account the professional competencies that a family physician must acquire)

Learning Outcomes (LO) *(Learning outcomes are formulated taking into account the professional competencies that a family physician must acquire)*	
In terms of knowledge:	
LO1	Providing emergency medical care in frequently encountered situations (therapy, pediatrics, and resuscitation);
LO2	Ability to correctly assess the condition of the simulator (patient), collect medical history, and interpret data from laboratory and instrumental diagnostic methods related to examination, treatment, and prevention.
LO3	Ability to interpret auscultation findings and laboratory parameters; knowledge of modern methods for the treatment and prevention of diseases of internal organs.
In terms of skills:	
LO1	Ability to collect a correct and complete medical history from patients and provide subjective and objective assessment of their condition;
LO2	Development of clinical thinking when establishing diagnoses in patients;
LO3	Advanced cardiopulmonary resuscitation.

Course Content *(Topics of lectures and practical classes are formed based on the professional competencies that a family physician must acquire)*	
Type of classes: lecture (M) *(Lecture sessions are not предусмотрены in the curriculum)*	
M1	Simulation-Based Education: Diagnostic methods in pulmonary and cardiac diseases
M2	Simulation-Based Education: Basic cardiopulmonary resuscitation
Type of classes: practical training (A)	
1. Care of therapeutic patients	
A1	Topic 1. Lung auscultation. Improving the technique of lung auscultation using a simulator trainer and learning to establish preliminary diagnoses for various diseases.
A2	Topic 2. Cardiac auscultation. Improving the technique of cardiac auscultation using a simulator trainer and learning to establish preliminary diagnoses for various diseases.
A3	Topic 3. Assessment of the patient's emergency condition. Basic cardiopulmonary resuscitation. Complications during cardiopulmonary resuscitation.

Practical skills	
1.	Pulmonary-cardiac resuscitation

Independent study (IS)	**Hours**
1	First aid in an acute attack of bronchial asthma
2	Classification of burns, degrees, and first aid algorithm
3	Etiology and classification of stroke and first aid algorithm in stroke
4	Etiology and classification of myocardial infarction and first aid algorithm
5	First aid algorithm in acute cholecystitis

Independent study (IS)	Hours
6	First aid in hyperthermia syndrome in children
7	Assessment of reflexes in newborns
8	Physical examination in newborns
9	Cardiopulmonary resuscitation in children
10	Obstructive syndrome in children
Total	**15**

	Main literature
1	JAV uchun amaliy ko‘nikmalar to‘plami. Gadayev A., Axmedov X., Toshkent 2014.
2	Сборник практических навыков для врачей общей практики. Практическое руководство. А.Гадаев, Х.Ахмедов. 2010.
3	Критические и неотложные состояния в медицине. Вайман М.А., Аваков В.Е. Москва. “ВЕЧЕ”. 2003.
4	Сестринский уход в терапии с курсом первичной медицинской помощи. Учебное пособие. Смолева Э.В. Ростов-на-Дону “Феникс”. 2019.
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1	Shoshilinch holatlar. Darslik. Тез тиббий ёрдам. O.Eshonov. “Tafakkur” nashriyoti. Toshkent-2019.
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5	Программа освоения практических умений по методике “стандартизированний патсиент” [Электронний ресурс] / Булатов С.А., Хамитов Р.Ф. - Казан: Казанский ГМУ, 2006. - http://www.studmedlib.ru/book/skills-2.html
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8	First Aid in Case of Accidents and Emergency Situations [Електроннійресурс]: Preparation Questions Preparation Questions for a Modular Assessment / Levchuk I.P., Kostyuchenko M.V. - М.: ГЕОТАР-Медиа, 2015.
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	Internet saytlari
1	www.minzdrav.uz
2	www.ziyonet.uz

3	http://meduniver.com
4	http://www.who.int/ru
5	http://education-portal.com

Monitoring student's academic performance
Criteria

100-point system	5-point system	The student's level of knowledge must meet the following criteria to earn points
90–100	**5**	– fully explains the essence and content of the course;– presents course topics with scientific accuracy and logical consistency, without scientific errors or confusion;– has a clear understanding of the theoretical and/or practical significance of the course materials;– demonstrates the ability to think independently and freely within the scope of the course;– provides precise and concise answers to the given questions;– has thoroughly prepared lecture notes;– has completed independent assignments fully and accurately;– has mastered all practical skills and competencies;– is able to apply theoretical knowledge in various situations;– follows a systematic approach and ensures coherence.
70–89.9	**4**	– understands the essence and content of the course and does not allow scientific or logical inconsistencies when presenting topics;– understands the practical significance of the course content;– completes assigned tasks and assignments within the framework of the curriculum;– provides correct answers to course-related questions;– has well-prepared course notes;– has fully completed independent assignments;– demonstrates effort to master all practical skills and competencies.
60–69.9	**3**	– has a general understanding of the course;– covers course topics within a limited scope and allows some inconsistencies in presentation;– lacks fluency in explanation;– provides vague and confusing answers to course-related questions;– course-related texts are not well structured.
0–59.9	**2**	– has not prepared for course sessions;– has no understanding of the course content;– shows signs of copying course materials from others;– course-related texts contain serious errors and inconsistencies;– fails to answer course-related questions;– lacks knowledge of the course.

Information about the subject teacher

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This Syllabus was approved by the statement of the meeting of the Educational and Methodological Council of TashSMU dated 26.05.2025 № 10.

This Syllabus was approved by the statement of the meeting of the Department of Clinical modeling dated 24.05.2025 № 10.

Head of the Educational and Methodological Department Azizova F.Kh.
Faculty Deans
Dean of the Medical Faculty №1 I.O.Otajonov
Dean of Medical Faculty №2 A.A. Irnazarov

Handouts
Situational problems

Situational problem No 1

In the school cafeteria, a 6th-grade student experienced a convulsive cough and difficulty breathing during a hasty meal and conversation. He is worried about the pain in his throat. The patient becomes confused, speaks with difficulty, and is frightened. His face is cyanotic. A hoarse voice. Noisy breathing with periodically recurring convulsive coughing fits and difficulty breathing.

Questions

1. Determine the patient's emergency condition.
2. Create an algorithm for providing first aid.
3. Indicate the technique of mechanical ventilation (MV).

Situational problem No 2

A 42-year-old patient suddenly developed asthma in the polyclinic's emergency room. The patient sits, arms resting on the edges of the chair, chest in a maximally inspired position, face cyanotic, expressing fear, respiratory rate 38 breaths per minute. At a distance, breathing difficulties of an expiratory nature, dry whistles are heard.

Questions

1. Identify and justify the emergency situation that developed in the patient.
2. Develop an algorithm for providing emergency medical care and justify each step.
3. Explain the technique of using a pocket-measured dose inhaler.

Situational problem No. 3

The students passed the exam and got off standing in a crowded bus. Suddenly one of them fell ill. He turned pale and fell. Objectively: unconscious, pale skin, cold limbs, narrow pupils, no effect on light, thready pulse.

Questions

1. Identify and justify the type of emergency.
2. Develop an algorithm for providing emergency medical care and justify each step.
3. Indicate the technique for calculating respiratory rate (RR).

Situational problem No. 4

Patient V., 42 years old, is being treated in the therapeutic department with a diagnosis of exacerbation of bronchial asthma. Suddenly, he developed an attack of acute shortness of breath with difficulty exhaling. He suffered from bronchial asthma.

Objectively: general condition is severe, patient sits with hands on the back of the bed, breathing is wheezing, dry rales "from afar," cough with difficult-to-detect gray sticky sputum. Body temperature 36.2°C. NPV in 1 minute 28. Multiple rales were detected during lung auscultation. Pulse in 80 minutes, satisfactory filling and tension. Blood pressure 110/65 mm Hg. Art. The abdomen is soft and painless.

Questions

1. Identify and justify the emergency situation.
2. Create an algorithm for emergency first aid.

Situational problem No 5

Patient Yu., 65 years old, admitted to the therapeutic department with a diagnosis of myocardial infarction, acute period, after attempting to sit in bed, severe weakness, dizziness developed.

Objectively: general condition is severe, bedridden; gaze is indifferent, speech is sluggish, answers questions with difficulty. Skin is moist, gray; hands and feet feel cold to the touch; fallen veins. Body temperature 36.5°C. BR 20. Breathing in the lungs weakens. Pulse 104 per minute, weak uneven filling and voltage. Blood pressure 90/45 mmHg Art. Heart sounds are deaf, the rhythm is disrupted.

Questions

1. Identify and justify the emergency situation.
2. Develop an algorithm for providing emergency medical care.

Test control questions

1. Which of the following does not belong to the respiratory function of the lungs?
A. Utilization of O2 in tissues
V. Ventilation
C. Perfusion
D. Diffusion
2. Ventilation adequacy depends on the following factors:
A. To the state of central respiratory regulation
V. To the state of hemodynamics
C. Harmful habit
D. Immune system status
2. Can lead to impaired lung ventilation
A. Obstruction
V. Thromboembolism
C. Hypertension
D. Hypotonia
4. Travel method is:
A. Head bowing
V. Tracheostomy
C. Tracheal intubation
D. Conicotomy
5. Types of bleeding cessation:
A. Ventricular fibrillation
V. Cardiac tamponade
C. Hypoxia
D. Hypercapnia
6. Instructions for mechanical ventilation:
A. Apnea
B. High AD
C. Decrease in CaO2 below 95%
D. Anuria
7. When is the Geimlich method effective:
A. In food piece obstruction
V. When drowning in fresh water
C. When drowning in seawater
D. Unconscious
8. Complications of the Heimlich maneuver:
A. Liver irritation
V. Fracture of nose
C. Laceration of bladder
D. Fracture of mandible
9. How is the effectiveness of cardiac massage determined:
A. Appearance of carotid artery pulsation
Loss of V. Corachik's reaction to light
C. Pupil dilation
D. Anisocoria
10. Complications of indirect cardiac massage:
A. Rib fracture
V. Injury of bladder
C. Brain injury
D. Stomach perforation
11. Indirectly, mechanical ventilation includes:
A. Schefer's method
V. Air supply from mouth to mouth

S. Heimlich's method
D. Horingoscopy
12. How is a patient in unconscious condition transported?
A. Sideways
V. Turn your head back to your stomach
C. Vertically
D. With drooping head
13. Stages of death:
A. Pre-agonal state
V. Collapse
S. Shock
D. Coma
14. You saw an unconscious person on the street, your tactic:
A. Checking for respiratory movements
V. Electrical defibrillation
C. Extubation
D. Intubation
15. Cause of respiratory distress in anaphylactic shock: Cause of respiratory distress in anaphylactic shock:
A. Bronchiolospasm
V. Spontaneous pneumothorax
C. Disorders of nerve conduction
D. Brain swelling

O'ZBEKISTON RESPUBLIKASI SOG'LIQNI SAQLASH VAZIRLIGI
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KLINIK MODELLASHTIRISH KAFEDRASI

«TASDIQLAYMAN»
Toshkent davlat tibbiyot universiteti
O'quv ishlari bo'yicha
prorektor O.N.Xaitov

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KAFEDRADA 1 VA 2 – SON DAVOLASH FAKULTETI 3-KURS TALABALAR BILIMINI NAZORAT QILISH REYTING NIZOMI

Tuzuvchilar:

kafedra mudiri, t.f.d., dotsent Parpibayeva D.A.

dostsent Salayeva M.S.

MINISTRY OF HIGHER EDUCATION, SCIENCE AND INNOVATIONS OF THE REPUBLIC OF UZBEKISTAN

MINISTRY OF HEALTH OF THE REPUBLIC OF UZBEKISTAN

TASHKENT STATE MEDICAL UNIVERSITY

" APPROVED "
Vice-Rector for Academic Affairs
_____ K.N. Khaitov

«____» _____ 2025.

REGULATION

ON THE RATING ASSESSMENT OF STUDENTS

Authors:
Head of Department, Associate Professor Parpibaeva D.A.
Associate Professor Salaeva M.S.

Ташкент - 2025

The Regulation on the rating for monitoring the knowledge of 3rd year students of the department was developed on the basis of the updated Regulation on the rating, based on the Order of the Ministry of Higher and Secondary Specialized Education of the Republic of Uzbekistan No. 333 dated August 25, 2010 and the Regulation on the "Procedure for monitoring and assessing the knowledge of 1st-3rd year students, students studying on the credit-modular system of education at the Tashkent State Medical University", approved by Appendix 5 to the Order of the Rector of the Tashkent Medical Academy No. 01529 dated September 18, 2023. The department operates on the basis of the curriculum approved by the academic department. At the department, 3rd-year students of the 1st and 2nd medical faculties receive knowledge on the subject of simulation training.

Types and forms of control of students' knowledge at the department:

- current control (CC);
- credit (exam).

The level of assimilation of students' knowledge on the subject is assessed on a 100-point system, the results are expressed in whole numbers.

The procedure and criteria for assessing the knowledge of 3rd year students:

The level of the student's acquisition of knowledge on the subject is assessed on a 100-point scale, and the results are expressed as whole numbers. These 100 points are distributed among the types of control as follows:

The indicator of a student's acquisition of knowledge in subjects ending with a test is expressed as the average value of points scored in the current control: Current score is 100 points (JN 80 + MT 20).

Current monitoring of specialized subjects is carried out by assessing the following types of work on a 100-point scale:

- theoretical knowledge of the student;
- practical training of the student (practical/clinical skills).

When assessing JN in clinical subjects, the ratio of theoretical knowledge and practical skills is 40:60, in theoretical subjects – 50:50, in social and humanitarian subjects 100% of theoretical knowledge is assessed.

№	Item	Theory*	Practice **
1	Clinical	40	60
2	Theory	50	50
3	Social and humanitarian	100	-

* – Question and answer sessions on the topic, written assignments,

situational questions and test solutions;

** – Patient care, clinical audit, practical skills, work on a simulator (volunteer), night shift report, medical history defense.

The student's overall grade for the subject per semester is calculated using the following formula for each type of control (TC, IC):

TC = 0.6*TC + 0.1*SRS; OB = 0.7*TC + 0.3*IC

where: TC – current control; SRS – average current control; SRS – grade for students' independent work; OB – overall score; IC – final control.

The student's knowledge is assessed on a 100-point scale based on the criteria presented in the following table:

Point	**Level**	**5 scoring system**	**Grade**	**Criteria**
90-100	A	5	Excellent	The student makes independent conclusions and decisions, is able to think creatively, observe independently, is able to apply the acquired knowledge in practice,
70-89,9	B	4	Fine	The student conducts independent observations, is able to apply the acquired knowledge in practice, understands, knows, can express and tell the essence of the subject (subject), has an idea of the subject (subject).
60-69,9	C	3	Satisfactorily	The student is able to apply the acquired knowledge in practice, understands, knows, can express and tell the essence of the subject
0-59,9	F	2	Unsatisfactory	The student has not mastered the subject program, does not understand the essence of the subject (subject) and has no idea

Based on these standard criteria, specific criteria for each type of control are developed for each subject, which are approved by the head of the department and communicated to students.

The procedure for transferring from one course to another

The summer examination session is considered a transfer session, and passing subjects with satisfactory grades is not sufficient grounds for moving on to the next year.

Transfer of students from one course to another is carried out on the basis of their average grade (hereinafter referred to as GPA) at the end of each academic year.

The average grade (GPA) of a student for the academic year and the entire period of study is determined by the following formula:

$$GPA = \frac{K_1 * U_1 + K_2 * U_2 + K_3 * U_3 \ldots + K_n * U_n}{K_1 + K_2 + K_3 \ldots + K_n}$$

Here, K - the number of credits allocated to each subject;

It is the grade a student receives in each subject.

To move from one level to another, a student must have an average grade point average of at least 2.6 at the end of the academic year.

To receive a privileged academic degree, a graduate must have an average grade point average of at least 3.75 and pass the final state certification with an "excellent" grade.

A bachelor's degree student must have a minimum GPA of 2.6 at the end of the final year, successfully complete the subjects required by the 4-, 5- and 6-year study program, and earn 240, 300 and 360 credits, respectively.

The general period of study lasts until the term established by law.

FINAL EXAM ASSESSMENT:

At the department, 3rd year students of the 1st and 2nd medical faculties take a test (exam) on simulation training.

Type of control and evaluation criteria

1. Based on the database of control of students' knowledge and skills, the level of mastery of the discipline by the student in the disciplines taught at the Department of Clinical Modeling is expressed through points, and the current monitoring of the student in the discipline and the indicator of mastery of the discipline during the semester are carried out according to the "100-point" assessment system, and the results are expressed in whole numbers.

2. The purpose of assessing the knowledge, skills and competencies of students using the "100-point" system is to develop such characteristics as deep mastery of the subject and the disciplines taught, a creative approach to completing assignments and homework, taking into account the general education program,

which involves independent thinking and work, a desire to systematically improve one's knowledge and skills, and active use of modern literature.

3. During the current monitoring, the students' theoretical knowledge is assessed, as well as the correct sequence of practical skills and the level of their mastery.

4. During the ongoing assessment, students' clinical thinking on various situational issues and the ability to purposefully perform and analyze practical skills during the simulation process are taken into account.

5. The student's completion of assignments and independent study tasks within the framework of practical classes, as well as his activity in completing these classes, are assessed by the subject teacher.

6. Sinov fan yakunida tegishli amaliy ko‘nikmalar bo‘yicha talabaning nazariy bilim va amaliy ko‘nikmalarini o‘zlashtirish darajasini aniqlash maqsadida o‘tkaziladi.

7. The test type is formed by demonstrating basic and independently acquired skills within the framework of the topics covered following the training using simulation equipment, and their average score is formed.

8. Test types can be conducted in the form of objective systematized examinations.

Rules for retaking missed classes:

- A student who, at the end of the semester, has scored below the established score for each of the current and control types of disciplines is considered to have academic debt.
- Students with academic debt are given 1 month after the end of the semester to retake the course. During this time, a student who has not mastered the subject is expelled from the number of students by order of the rector in the established manner upon the submission of the dean of the faculty.
- Students who have missed 3 or more classes are allowed to continue their studies only with the permission of the dean’s office.
- Students are required to retake all missed practical classes. Students who fail to retake them will not receive a credit.
- Retaking three or more classes missed without a valid reason is permitted by a commission created at the faculty, with the permission of the coordinating council of deans.
- The department has a schedule of teachers on duty to make up for missed classes. Retakes are accepted daily according to the schedule and are recorded in the retake log.Документы, подтверждающие отработку пропущенных занятий студентом, хранятся на кафедре в течение 1 года.

PROCEDURE FOR ACCOUNTING AND ANALYSING RATING RESULTS:

1) The points scored by the student for the types of control of the discipline are entered into the grade book at the end of the semester as whole numbers. The column "Hours allocated according to the curriculum" of the grade book reflects the total load of the discipline for the semester (classroom + independent work), and the column "Assimilation indicator" - assimilation according to the 100-point assessment system.
2) A student’s performance below the passing grade is not recorded in the grade book.
3) The student's performance and the group's work quality index are regularly discussed at department meetings and necessary measures are taken.

Head of the Department, Doctor of Medical Sciences,
Associate Professor D.A. Parpibaeva