LECTURE COMPLEX

Name of the discipline: Emergency medical care-1
Discipline code: EMC-5302-1
Name of EP: 6B10101«General medicine»
Number of academic hours (credits): 150 hours (5 credits)
Course and semester: 5 course, 9 semester
Numbers of lectures: 10 hours

Shymkent, 2025 y.

The lecture complex was developed in accordance with the modular training program for the educational program «Emergency medical care-1» and was discussed at the meeting of the Department.

Protocol № 11 from "26" 06 2025 y.

Head of Department, candidate of medical sciences, docent: Seidakhmetova A.A.

Lecture№1

1. Topic: Organization of the emergency medical service in the Republic of Kazakhstan. Organization of medical care in emergency situations at the pre-hospital stage.

2. Purpose: To familiarize students with the rules of emergency medical care. The organization, scope, and principles of emergency medical care.

3. Lecture theses:

Since April 4, 2025, the order of the Minister of Health of the Republic of Kazakhstan No. 32 "On approval of the rules for the provision of emergency medical care, including with the involvement of medical aviation.

The dispatcher of the ambulance station receives all calls on the control panel 103, sorts them by the category of urgency of the call, and transmits them to paramedics and specialized SSMP teams through an automated call management system.

Calls of 1, 2, 3 categories of urgency

Calls of the 4th category of urgency are transferred to the paramedic and medical teams of the NMP departments at PHC.

1) the reason for the call of the **1st category** of urgency is the patient's condition, which poses an immediate threat to life and requires immediate medical attention;

2) the reason for the call of the **2nd category** of urgency is the patient's condition, which poses a potential threat to life without medical care;

3) the reason for the call of the **3rd category** of urgency is the patient's condition, which poses a potential threat to health without medical assistance;

4) the reason for the call of the **4th category** of urgency is the patient's condition caused by an acute illness or exacerbation of a chronic disease.

There are three levels of emergency medical care:

1) **red level** – includes calls of 1 – 2 categories of urgency, serviced at the level of the ambulance station;

2) **yellow level** – includes calls of 3 categories of urgency, serviced at the level of the ambulance station.;

3) **green level** – includes calls of 4 categories of urgency, serviced at the level of NMP departments at PHC.

The call processing time from the moment the call is received by the EMC dispatcher to the transfer for servicing to the EMC team is **5 minutes**.

The time of arrival of the EMC team to the patient's location from the moment of receiving the call from the EMC dispatcher is:

1 category of urgency – up to 10 minutes;

2 category of urgency – up to 15 minutes;

3 category of urgency - up to 30 minutes;

4 category of urgency - up to 60 minutes.

4.Illustrative material: Presentation

5.References:

Order of the Minister of Health of the Republic of Kazakhstan dated April 4, 2025 No. 32 "On approval of the Rules for the provision of emergency medical care, including with the involvement of medical aviation.

6.Security questions (feedback):

1. What is an emergency medical service?
2. What are the tasks of the EMC?

3. What categories of EMC calls do you know?
4. What is the triage system?
5. What order regulates the activities of the EMC service?

Lecture№2

1. Topic: Terminal states. Basic cardiopulmonary resuscitation.

2. Purpose: To teach students how to assess a patient's condition in terminal conditions, emergency care skills, and develop an algorithm for basic CPR.

3.Lecture theses:

A critical level of vital activity disorder with a catastrophic drop in blood pressure (BP), a profound violation of gas exchange and metabolism is generally referred to as a terminal condition, and the moment of complete cessation of blood circulation and respiration is clinical death. There is a widespread three-stage classification of terminal condition: predagonia, agony, clinical death.

Pre-diagonal condition: general lethargy, confused consciousness, blood pressure is not detected, there is no pulse in the peripheral vessels, but it is palpable on the carotid and femoral arteries; respiratory disorders are manifested by pronounced shortness of breath, cyanosis or pallor of the skin. Some authors single out the term "terminal pause" - a short-term cardiac and respiratory arrest presumably of vagal origin. Then the heart rate is restored.

The agonal condition is diagnosed on the basis of the following symptom complex: lack of consciousness and ocular reflexes, undetectable blood pressure, a sharp weakening of the pulse in large arteries; during auscultation, dull heart tones are detected; pronounced signs of hypoxia and cardiac arrhythmias are recorded on the ECG.

Clinical death is a condition in which there is a complete cessation of blood circulation and respiration.

Cardiopulmonary resuscitation is a system of emergency measures performed to bring patients out of a terminal state and then maintain life.

Isolated respiratory arrest also requires resuscitation (ventilator), but without cardiac arrest, clinical death is not considered.

At clinical death, patients are diagnosed with complete loss of consciousness, lack of breathing, blood circulation, atony, and areflexia. At the same time, one of the types of circulatory arrest is recorded on an ECG or a heart monitor screen: ventricular fibrillation (VF) or ventricular tachycardia (VT) without a pulse, asystole, and electrical activity of the heart without a pulse.

Diagnosis of clinical death is based on a combination of the following symptoms:

– unconsciousness (coma);
- lack of breathing (apnea);
– circulatory arrest;
– Dilation of pupils and their lack of reaction to light;
- Seizures
- Pallor and cyanosis.

The provision of basic emergency care consists of the following actions

1) Make sure that the victim and you (the BLS team) are safe.;

2) Assess the victim's consciousness by shaking him slightly by the shoulders and asking loudly:"*Are you all right***?"**

If he answers the question, make sure that he is not in danger, provide assistance if necessary, and assess his condition at all times**..** Assessment of the condition

If the victim does not answer the question, then: c**all someone for help and instruct them to call the EMC and inform them** "*Code Blue, location: floor, block, office*"

3) place the victim on his back preferably on a **hard surface;**

4) Free up access to the respiratory tract by lifting your chin – grab your chin with one hand, hold your head with the other hand, **tilt your head back**.

To call/make a call

It is not recommended for non-professional resuscitators to push the jaw too far, as this is difficult to perform and can cause displacement of the spine.

However, an unprofessional resuscitator can open the airway by tilting his head back and lifting his chin.

5) Keeping the airway open, look, listen and feel the presence of breathing in the victim, for this:

• Look at the chest;

• Listen for breathing sounds.;

• Feel the victim's breath on your cheeks;

• **Assess whether breathing** is normal, impaired, or absent.

• For the first few minutes after a heart attack, the victim's breathing may be barely noticeable, infrequent, slow or noisy.

• Within no more than 10 seconds, it is necessary to assess the nature of the victim's breathing by looking, listening and feeling, if there are any doubts about breathing, act as if breathing is disturbed.

1) If the victim is breathing normally, then:

• Place the victim on his side with his arms and legs bent, with his mouth closer down;

• Invite for help;

• Continue to evaluate your breathing.

2) If the victim's breathing is abnormal (pathological), then:

- Kneel to the side of the victim, begin **chest compression (indirect heart massage):**
- Place your palm on the lower half of the victim's chest. Place the palm of your other hand on top of the back of your first hand and lock it.
- Keep your hands straight and vertical to the victim's body;
- Make sure that your palms are not on your stomach or on your ribs.;
- Start compressions (external heart massage), counting **aloud** without interrupting the **count from 1 to 30**;
- The depth of the chest excursion should be at least 5 cm, avoiding chest compressions to an excessive depth of more than 6 cm. After each compression, the chest should return to its previous state, but in no case remove your hands from the victim's body to prevent the compression point from moving;
- The compression rate should be at least **100 beats per minute, but not more than 120 beats per minute.**

1) After each 30th compression, perform **artificial respiration (ventilation**), for this:

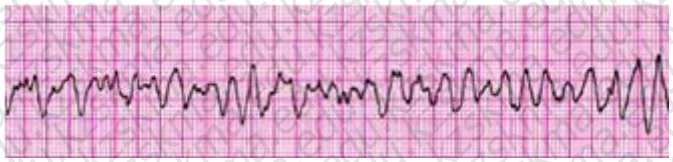
- Open the airway by tilting the victim's head back with the hand supporting the victim's forehead,
- Cover your nose with your index finger and thumb,
- Open the mouth with the other hand, pushing the jaw forward.
- After taking air into their lungs, they wrap their lips around the victim's mouth completely and inhale into the victim's mouth.
- The effectiveness of artificial ventilation is judged by the movement of the chest: after artificial inspiration, the chest returns to its previous position on its own.
- **The duration of inspiration is 1 second.**

An additional (2nd) breath is taken, the duration of both breaths should take no more than 5 seconds.
1 cycle = 30 : 2 (24 seconds),
1 period = 5 cycles(2 minutes)
4.Illustrative material: Presentation
5.References:
1. Vertkin A., Sveshnikov K. Guidelines for emergency medical care. Moscow. - Publishing house E. – 2017. – 560 p.
2. Emergency care in a therapeutic clinic. Edited by A.V. Gordienko. – Special Edition. – 2017. – 229 p.
3. Emergency outpatient cardiology: a short guide / V. V. Ruksin. - 2nd ed. - Moscow : GEOTAR-Media, 2016.- 255 p.
4. Emergency medical care. Clinical recommendations. Edited by S.F. Bagnenko. - GEOTAR Media. - 2018. – 896 p.
6.Security questions (feedback):
1.What are terminal states?
2. What is clinical death?
3. What signs of clinical death do you know?
4. What are the differences between clinical and biological death?
5. What is the algorithm for conducting basic CPR in adults?
6. What is the compression/respiration ratio in adults?
7. What is the frequency of compression in adults?
8. What is the depth of compression in adults?
9. What is 1 cycle and 1 period?
10. How often does the compressor change?
11. How is the effectiveness of intensive care assessed?
12. How long does the intensive care unit last?

Lecture №3
1. Topic: Advanced cardiopulmonary resuscitation. The shock rhythm.
2. Purpose: To teach students the skills of ACLS in shock rhythm.
3. Lecture theses:
In this case, one type of circulatory arrest is recorded on an ECG or a heart monitor screen: ventricular fibrillation (VF) or ventricular tachycardia (VT) without a pulse.

Ventricular fibrillation

Discoordinated contractions of myocardial fibers, leading to the inability to form cardiac output



Ventricular tachycardia without pulse

The high rhythm frequency (> 150) makes it impossible to fill the ventricular cavity during diastole, which leads to a sharp decrease in cardiac output.

• CPR is performed according to the C-A-B scheme in accordance with international standards (2020, AHA).
• It is necessary to perform defibrillation as soon as possible, i.e. as soon as the defibrillator is ready for operation, stop CPR and apply a discharge.
• Chest compression (100-120 in 1 min), compression-inhalation ratio 30:2 (regardless of the number of intensive care units).
• Chest compression depth 5-6 cm.

The defibrillator discharge is applied as quickly as possible.

With a monophasic defibrillator: only 360 J; with a biphasic (according to manufacturers' recommendations): 120-200 J.

In case of failure: Epinephrine (every 3-5 minutes) (0.1%) in 1.0 ml (1 mg) per 10 ml of isotonic NaCl solution, followed by CPR and repeated EIT - 360 J.

In case of failure: Intravenous injection of amiodarone (cordarone) 300 mg per 20 ml of 5% glucose; -lidocaine 1.5 mg/kg intravenously per kg (evidence level A). CPR - EIT (360 J).

In case of failure:epinephrine 1.0 mg IV, amiodarone 150 mg per 20 ml of 5% glucose (lidocaine 1.5 mg/kg IV) kg [A]. CPR - EIT (360 J).

When determining the rhythm of Torsadepointes: magnesium sulfate 10 ml of a 25% solution of IV CPR - EIT (360 J) kg.

4.Illustrative material: Presentation

5.References:

1. Vertkin A., Sveshnikov K. Guidelines for emergency medical care. Moscow. - Publishing house E. – 2017. – 560 p.
2. Emergency care in a therapeutic clinic. Edited by A.V. Gordienko. – Special Edition. – 2017. – 229 p.
3. Emergency outpatient cardiology: a short guide / V. V. Ruksin. - 2nd ed. - Moscow : GEOTAR-Media, 2016.- 255 p.
4. Emergency medical care. Clinical recommendations. Edited by S.F. Bagnenko. - GEOTAR Media. - 2018. – 896 p.
5. Clinical protocol for diagnosis and treatment of Sudden death. Approved by the Joint Commission on the Quality of Medical Services of the Ministry of Health of the Republic of Kazakhstan dated June 19, 2024. Protocol No. 208.

6.Security questions (feedback):

1. What is a shock rhythm?
2. What algorithm is used for a shock rhythm?

3. How is defibrillation performed?
4. When and in what doses is epinephrine administered?
5. When and in what doses is amiodarone administered?
6. When and in what doses is magnesium sulfate administered?
7. When and in what doses is sodium bicarbonate administered?

Lecture №4

1. Topic: Advanced cardiopulmonary resuscitation. Non-shock rhythm.

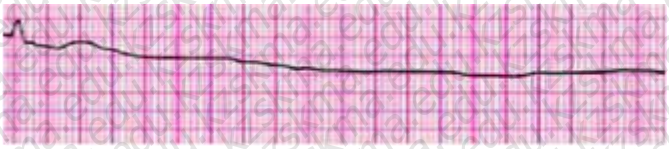
2. Goal: To teach students the skills of ACLS in non-shock rhythm.

3. Lecture theses:

At the same time, one of the types of circulatory arrest is recorded on the ECG or the heart monitor screen: asystole, electrical activity of the heart without a pulse.

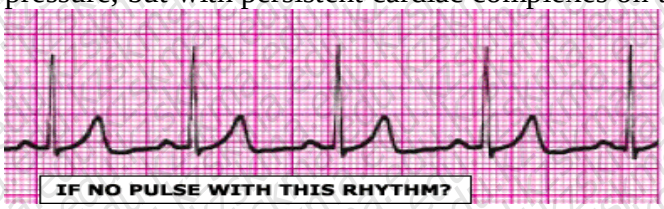
Asystole

Absence of cardiac contractions and electrical activity of the myocardium, confirmed in three ECG leads.



Pulse-freecardiacactivity

Severe suppression of myocardial contractility with a decrease in cardiac output and blood pressure, but with persistent cardiac complexes on the ECG



CAUSES OF BEA

5 G:

- **H**ypoxia - (**H**ypoxia)
- **H**ypovolemia - (**H**ypovolemia)
- **H**yper**, H**ypokalemia -(**H**yper/**H**ypokalemia)-
- **H**ypotermia - (**H**ypotermia)
- **H**ydrogen ion - (**H**ydrogen ion)

5T:

- Valvular pneumo**t**horax
- **T**amponade (of the heart)
- **T**oxins
- **T**hromboembolism(of the pulmonaryartery)
- **T**hrombosis(of the coronaryartery)

The procedure for providing assistance with non-shock rhythms:

Asystole and EMD:

• CPR is performed according to the C-A-B scheme in accordance with international standards (2015, AHA).

• Defibrillation is not performed.

• Chest compression (100-120 in 1 min), compression-inhalation ratio 30:2 (regardless of the number of intensive care units).

• Chest compression depth 5-6 cm.
Epinephrine (every 3-5 minutes) (0.1%) i.v. 1.0 ml (1 mg) per 10 ml of isotonic NaCl solution,
• Atropine (0.1%) in 1.0 ml (1 mg), repeated every 3 minutes.
The dose can be increased to 3 mg if the standard dose does not work to a total dose of 0.04 mg / kg.

4.Illustrative material: Presentation

5.References:

1. Vertkin A., Sveshnikov K. Guidelines for emergency medical care. Moscow. - Publishing house E. – 2017. – 560 p.
2. Emergency care in a therapeutic clinic. Edited by A.V. Gordienko. – Special Edition. – 2017. – 229 p.
3. Emergency outpatient cardiology: a short guide / V. V. Ruksin. - 2nd ed. - Moscow : GEOTAR-Media, 2016.- 255 p.
4. Emergency medical care. Clinical recommendations. Edited by S.F. Bagnenko. - GEOTAR Media. - 2018. – 896 p.
5. Clinical protocol for diagnosis and treatment of Sudden death. Approved by the Joint Commission on the Quality of Medical Services of the Ministry of Health of the Republic of Kazakhstan dated June 19, 2024. Protocol No. 208.

6.Security questions (feedback):

1. What is a non-shock rhythm?
2. What does the monitor show with a non-shock rhythm?
3. What algorithm is used with a non-shock rhythm?
4. When and in what doses is epinephrine administered?
5. When and in what doses is atropine administered?
6. What are the causes of EMD?

Lecture№5

1. Topic: Hypertension. Help with hypertensive crisis.

2. Purpose: To teach students algorithms for diagnosis and treatment of hypertensive crisis.

3.Lecture abstracts:

The term "crisis" (French. Crise is a fracture.seizure) is used to refer to sudden changes in the body, which are characterized by the paroxysmal appearance or intensification of symptoms of the disease and are transient in nature.

A hypertensive crisis should be considered not so much a sudden increase in blood pressure above any conditional level, as a sharp deterioration in well-being, accompanied by even a slight increase in blood pressure.Headaches and nausea, dizziness and vomiting, a feeling of compression or heaviness behind the sternum are the most common complaints of patients with hypertensive crisis.

They have a sharp redness of the face and neck, sometimes in the form of large red spots, sweating and trembling in the extremities. At the same time, blood pressure may not exceed 160/90 mmHg, although in a large number of cases it "jumps" to 200-240 /100 mmHg.Very often, such crises are accompanied by nosebleeds, which many consider as a complication, although it is this that often saves the patient from more serious troubles.

Severe complications of hypertensive crises are ruptures of cerebral vessels with hemorrhages in the brain - the so-called cerebral strokes or strokes. The patient suddenly loses consciousness and falls into a state of cerebral coma. If he does not die within a few days, then for many months and years he has been bedridden due to limb paralysis and impaired many brain functions.

Another equally dangerous complication is the development of myocardial infarction and heart failure.

4.Illustrative material: Presentation

5.References:

1. Clinical protocol for the diagnosis and treatment of "Hypertensive crisis". Approved by the Joint Commission on the Quality of Medical Services of the Ministry of Health of the Republic of Kazakhstan dated June 23, 2016. Protocol No. 5.
2. Hypertensive crises: pathogenesis, clinical picture, diagnosis, treatment and prevention. Textbook for doctors / N.I. Gaponova [et al.], Moscow: Libri Plus, 2014, 120 p. Fundamentals of Care for General Trauma: Reference edition: D. Skinner, P. Driscoll 4th Edition, 2018 ICRC

6.Security questions (feedback):

1. What is a hypertensive crisis?
2. Symptoms of hypertensive crisis.
3. Principles of emergency care in hypertensive crisis.

Lecture№6

1. The theme: Acute coronary syndrome. Myocardial infarction.

2. Purpose: To teach students algorithms for the diagnosis and treatment of ACS.

3.**Lecture abstracts:**

Classification:

1. Patients with acute persistent chest pain and stable ST segment elevation on the ECG (>20 min) belong to the ACS group with ST segment elevation.
2. Patients with acute chest pain but without ST segment elevation on the ECG belong to the ACS group without ST segment elevation.

Changes in the ECG can be in the form of a transient elevation of the ST segment.

STEMI Forms:

The main thing in the management of patients with STEMI at all stages of care is, along with diagnosis, constant stratification of the risk of developing cardiac complications.

As a result, two clinical forms are differentiated in the outcome of STEMI:

1. Unstable angina pectoris.
2. Myocardial infarction without ST segment elevation.

STEMI Forms:

The main thing in the management of patients with STEMI at all stages of care is, along with diagnosis, constant stratification of the risk of developing cardiac complications.

As a result, two clinical forms are differentiated in the outcome of STEMI:

Unstable angina.

Non-ST segment elevation myocardial infarction

Myocardial infarction

— an urgent clinical condition caused by necrosis of a section of the heart muscle as a result of a violation of its blood supply.

Acute coronary syndrome is a collective term that includes conditions caused by acute progressive myocardial ischemia

: unstable angina;

■ myocardial infarction without ST segment elevation, differential diagnosis between these two conditions is not performed on the EMC, therefore they are combined by the term "acute coronary syndrome without ST segment elevation";

n myocardial infarction with ST segment elevation in the first hours of the disease and subsequent formation of the Q wave, which is considered separately.

Typical complaints

Intense pain behind the sternum and in the heart area of a pressing or compressing nature (the intensity is more pronounced than with a normal angina attack).

The attack is unusually long, lasting more than 15 minutes.

Possible irradiation to the left or right arm, neck, lower jaw, under the left shoulder blade, into the epigastric region.

The patient is agitated, restless, and notes the fear of death.

Sublingual intake of nitrates is ineffective or does not completely eliminate pain, or the pain resumes within a short time.

pallor of the skin,

Hyperhidrosis (sometimes "cold sweat" on the forehead),

■ Severe general weakness,

■ feeling of lack of air.

The absence of a typical clinical picture cannot serve as evidence of the absence of myocardial infarction.

ACTIONS ON A CALL. MANDATORY QUESTIONS

When did the chest pain attack start? How long does it last?

What is the nature of the pain? Where is it localized and is there radiation?

Have there been any attempts to stop the attack with nitroglycerin?

Does pain depend on posture, body position, movement, and breathing? (there is no myocardial ischemia)

What are the conditions of pain (physical exertion, agitation, cooling, etc.)?

Did seizures (pain or suffocation) occur during physical exertion (walking), did they cause them to stop, how long did they last (in minutes), and how did they react to nitroglycerin? (The presence of angina pectoris makes the assumption of acute coronary syndrome very likely)

4.Illustrative material: Presentation

5.References:

1. Clinical protocol for diagnosis and treatment of "ST-segment elevation myocardial infarction". Approved by the Joint Commission on Quality of Medical Services of the Ministry of Health of the Republic of Kazakhstan dated November 10, 2017, Protocol No.

32.2. Clinical protocol for diagnosis and treatment of "ACS without ST segment elevation (Unstable angina, myocardial infarction without ST segment elevation)". Approved by the Joint Commission on the Quality of Medical Services of the Ministry of Health of the Republic of Kazakhstan dated June 23, 2016. Protocol No.

5.3. Emergency medical care. Clinical recommendations / edited by: S.F. Bagnenko. - M.: [B. I.], 2015. -871 p.

6.Security questions (feedback):

What is ACS?

1. What types of ACS do you know?
2. What are the symptoms of ACS?
3. An algorithm for treating ACS.
5. What is IM?
6. Symptoms of MI.
7. Principles of emergency care for MI.

Lecture№7

1. Topic: Acute heart failure. Cardiogenic shock. Pulmonary embolism.

2. Purpose: To study the symptoms of acute myocardial infarction, angina pectoris and provide first aid to such patients.

3. Lecture theses:

Heart failure is a clinical syndrome associated with acute or chronic heart failure and, as a result, insufficient blood supply to organs and tissues.

The root cause is a deterioration in the heart's ability to fill or empty due to myocardial damage. Depending on how fast heart failure develops, it is divided into acute and chronic.

Acute heart failure can be associated with injuries, toxins, and heart disease, and without treatment, it can quickly lead to death.

Acute heart failure (ARF), which is a consequence of impaired myocardial contractility and a decrease in systolic and minute blood volumes, is manifested by extremely severe clinical syndromes: cardiogenic shock, pulmonary edema, acute renal failure.Acute heart failure is more often left ventricular and can manifest as cardiac asthma, pulmonary edema, or cardiogenic shock.

Causes of acute heart failure:

• a common cause is mental overexertion in the presence of a heart defect or other heart disease,
• cardiospasm,
• coronary thrombosis,
• physical overexertion,
• tamponade in pericarditis,
• overload of the left ventricle in hypertension,
• overload of the right ventricle in lobar pneumonia.

The term "crisis" (French. Crise is a fracture.seizure) is used to refer to sudden changes in the body, which are characterized by the paroxysmal appearance or intensification of symptoms of the disease and are transient in nature.

A hypertensive crisis should be considered not so much a sudden increase in blood pressure above any conditional level, as a sharp deterioration in well-being, accompanied by even a slight increase in blood pressure.Headaches and nausea, dizziness and vomiting, a feeling of compression or heaviness behind the sternum are the most common complaints of patients with hypertensive crisis.

They have a sharp redness of the face and neck, sometimes in the form of large red spots, sweating and trembling in the extremities. At the same time, blood pressure may not exceed 160/90 mmHg, although in a large number of cases it "jumps" to 200-240 /100 mmHg.Very often, such crises are accompanied by nosebleeds, which many consider as a complication, although it is this that often saves the patient from more serious troubles.

Severe complications of hypertensive crises are ruptures of cerebral vessels with hemorrhages in the brain - the so-called cerebral strokes or strokes. The patient suddenly loses consciousness and falls into a state of cerebral coma. If he does not die within a few days, then for many months and years he has been bedridden due to limb paralysis and impaired many brain functions.

Another equally dangerous complication is the development of myocardial infarction and heart failure.

PE is a sudden blockage of a branch of the pulmonary artery by a blood clot, followed by cessation of blood supply to the pulmonary parenchyma.

Clinical symptoms and syndromes of massive and submassive PE.

SUDDEN SHORTNESS OF BREATH AT REST (orthopnea is not typical!);

ASHY, PALE CYANOSIS; with embolism of the trunk and large pulmonary arteries - pronounced cyanosis of the skin, up to a cast-iron shade;

TACHYCARDIA, sometimes extrasystole, atrial fibrillation;

AN INCREASE in BODY TEMPERATURE (even in the presence of collapse), mainly associated with an inflammatory process in the lungs and pleura;
HEMOPTYSIS (observed in 1/3 of patients) due to a lung infarction;

4.Illustrative material: Presentation

5.References:

1. Clinical protocol for diagnosis and treatment of "Acute heart failure". Approved by the Protocol of the Expert Commission on Healthcare Development of the Ministry of Health of the Republic of Kazakhstan dated June 28, 2013 Protocol No. 13.
2. Clinical protocol for the diagnosis and treatment of "Cardiogenic shock". Approved by the Joint Commission on the Quality of Medical Services of the Ministry of Health of the Republic of Kazakhstan dated November 29, 2016. Protocol No.
16.3. Clinical protocol for the diagnosis and treatment of Cardiogenic pulmonary edema. Approved by the Joint Commission on the Quality of Medical Services of the Ministry of Health of the Republic of Kazakhstan dated November 29, 2016. Protocol No. 16.

6.Security questions (feedback):

What is acute heart failure?
2. What types of acute heart failure do you know?
3. What are the symptoms of acute heart failure?
4. Algorithm of care for acute heart failure.
5. Principles of emergency caregiving.
6. What is PE?
7. Symptoms of PE.
8. Principles of emergency care for PE.

Lecture№8

1. Topic: Emergency pulmonology.

2. Purpose: To teach students algorithms for providing assistance in acute respiratory failure from the standpoint of evidence-based medicine.

3.Lecture theses: Acute respiratory failure is currently understood as a syndrome in which the maximum stress of all compensatory systems of the body is unable to ensure its adequate oxygen saturation and the removal of carbon dioxide.

Pathogenetically, the development of acute respiratory failure is caused by hypoxia as a result of impaired alveolar ventilation, gas diffusion through alveolar membranes and oxygen utilization in tissues.

Acute respiratory failure is divided into primary and secondary. The primary one is associated with violations of the mechanisms of oxygen delivery from the external environment to the lung alveoli. It most often occurs with uncorrupted pain syndrome, impaired patency of the respiratory tract, damage to the lung tissue and respiratory center, endogenous and exogenous poisoning with impaired neuromuscular impulses.

Secondary respiratory failure is caused by impaired oxygen transport from the alveoli to the body tissues. The causes of its occurrence may be central hemodynamic disorders, microcyculations, cardiogenic pulmonary edema, pulmonary embolism, etc. Acute respiratory failure is also divided into ventilation and parenchymal. Ventilation includes respiratory failure, which has developed as a result of damage to the respiratory center of any etiology, impaired transmission of impulses in the neuromuscular apparatus, damage to the chest, lungs, etc. The parenchymal form can be caused by the development of obstruction, restriction, constriction of the respiratory tract, impaired diffusion of gases and blood flow in the lungs.

1. Acute respiratory failure of central origin. Acute respiratory failure of central origin occurs in some cases of poisoning, brain damage (traumatic brain injury, stroke), increased intracranial pressure, etc.
2. Acute respiratory failure associated with airway obstruction. Acute respiratory failure associated with airway obstruction can develop with laryngitis, bronchiitis, bronchospasm of various etiologies, foreign bodies of the respiratory tract and other pathological conditions.
3. Acute respiratory failure due to neuromuscular transmission disorders. Acute respiratory failure caused by impaired neuromuscular conduction can develop with tetanus, myasthenia gravis, myopathies, spinbulbar polio, residual curarization, metabolic disorders accompanying certain pathological conditions, etc. The clinical picture mainly depends on the etiology of the lesion and the severity of respiratory disorders.
4. Acute respiratory failure with impaired diffusion of gases through the alveolar-capillary membrane. The diffusion of gases through the alveolar-capillary membrane can be disrupted in pneumonia, chronic lung diseases with respiratory failure (pneumosclerosis, pulmonary emphysema), pulmonary edema, etc.
5. Acute respiratory failure associated with damage and diseases of the respiratory system. The causes of acute respiratory failure in traumatic chest injuries may be intrapleural bleeding, partial or complete shutdown of the lungs from gas exchange due to accumulation of air and blood in the pleural cavity, obstruction of the trachea and bronchi with blood, flotation and displacement of the mediastinum. The development of respiratory failure may also be due to impaired respiratory mechanics due to damage to the skeletal function of the chest and the development of severe pain syndrome.
Conicotomy (anatomical conus [elasticus] elastic cone + Greek tomē incision, dissection; synonym coniotomy) is the median dissection of the larynx between the cricoid and thyroid cartilages within the cricoid ligament.
In emergency cases, a conicotomy should be performed, which a doctor should be able to do under any conditions, with any tools (sometimes they can serve as a kitchen knife and a spout from a porcelain kettle).It is used in adults and children over 8 years old. Punctoconicotomy is performed in children under 8 years of age.
Conicotomy (dissection of the conical ligament) is a safer method compared to tracheotomy, since:
• at this point, the trachea is located closest to the skin
• no large vessels or nerves
• The manipulation is relatively simple to perform.

4.Illustrative material: Presentation

5.References:

1. Clinical protocol for diagnosis and treatment of "Asthmatic status". Approved by the Joint Commission on the Quality of Medical Services of the Ministry of Health of the Republic of Kazakhstan dated June 23, 2016. Protocol No. 5.
2. Clinical protocol for diagnosis and treatment of "Asphyxia". Approved by the Joint Commission on the Quality of Medical Services of the Ministry of Health of the Republic of Kazakhstan dated June 23, 2016. Protocol No. 5.
3. Emergency medical care. Clinical recommendations. Edited by S.F. Bagnenko. - GEOTAR Media. - 2018. – 896 p.

6.Security questions (feedback):

What is acute respiratory failure?
1. What is conicotomy?
2. Algorithm of first aid for acute respiratory failure

4. What is laryngospasm?
5. Symptoms of laryngospasm.
6. Principles of emergency care for laryngospasm.
7. Symptoms of bronchial asthma.
8. Principles of emergency care for asthma attacks and asthmatic status.

Lecture№9

1. Topic: Emergency allergology.

2. Purpose: To study the main types of allergic reactions of the body of an immediate type when an allergen enters the body, to analyze the general principles of emergency care.

3. Lecture abstracts:

This shock is scary primarily for its suddenness and high probability of death. The threat of a ridiculous death from a mosquito bite or a spoonful of strawberry jam hangs over each of us. Millions of people take analgin or eat lemons completely painlessly, but only someone can develop shock even after one tablet or a small slice of lemon. The insidiousness of allergies lies in the fact that you can never know in advance which new substance the body will respond to with such a reaction. This circumstance is one of the main causes of high mortality in allergic shock.

Identifies 3 stages:

- Immunological
- Immunochemical
- Pathophysiological

The rate of anaphylactic shock is from a few seconds or minutes to 2 hours after the start of contact with the allergen.

In the development of an anaphylactic reaction in patients with a high degree of sensitization, neither the dose nor the method of administration of the allergen play a decisive role.

However, a large dose of the drug increases the severity and duration of the shock.

1. A lightning-fast course is the most acute onset, with a rapid, progressive drop in blood pressure, loss of consciousness, and increasing respiratory failure.

A distinctive feature of the lightning-fast course of shock is resistance to intensive anti-shock therapy and progressive development up to a deep comatose state.

Death usually occurs in the first minutes or an hour due to damage to vital organs.

External manifestations of allergic shock:

1. Numbness and itching, burning sensation and compression of the skin and mucous membranes;
2. Swelling of the eyelids, lips, and soft tissues of the entire face and neck - Quincke's edema;
3. Isolated edema of the limb (most often two fingers or the entire hand or foot);
4. Sometimes brain edema - sudden loss of consciousness, convulsions, vomiting;
5. Lowering blood pressure;
6. Sometimes pulmonary edema is bubbling breathing.;
7. Hives-type rash;
8. Bronchopharyngospasm.

The course of anaphylactic shock:

Acute malignant: occurs with a typical type of shock.

Starting from 3 min to 30 min

Benign: stunning, moderate respiratory and circulatory disorders
Abortive: the most favorable.
Prolonged: it is detected during active antishock therapy
Recurrent: repeated shock develops after 4-5 hours, sometimes 10 days after the symptoms of shock have subsided.

4.Illustrative material: Presentation

5.References:

1. Clinical protocol for diagnosis and treatment of "Anaphylactic shock)". Approved by the Joint Commission on the Quality of Medical Services of the Ministry of Health of the Republic of Kazakhstan dated December 12, 2014protocol No. 9
2. Allergy protocol of diagnosis and treatment of RCRS (Republican Center for Health Development of the Ministry of Health of the Republic of Kazakhstan)Version: Clinical protocols of the Ministry of Health of the Republic of Kazakhstan — 2013

6. Control questions (feedback):

1. What is an allergic reaction?
2. Types of allergic reactions
3. What is anaphylactic shock and its types?
4. What is the algorithm for anaphylactic shock treatment?
5. When, how and in what doses is epinephrine administered?
6. When and in what doses is euphyllin administered?
7. When, what and in what doses are hormones administered?
8. When, what and in what doses are antihistamines administered?

Lecture №10

1. Topic: Urgent conditions in endocrinology.

2. Purpose: To study the main types of emergency conditions in endocrinology, to analyze the general principles of emergency medical care.

3. Lecture abstracts:

Diabetes mellitus (DM) is a group of metabolic (metabolic) diseases characterized by chronic hyperglycemia, which is the result of impaired insulin secretion, the action of insulin, or both of these factors.

Classification of diabetes:

Insulin-dependent diabetes mellitus (type I diabetes mellitus)
- Non-insulin-dependent diabetes mellitus (type II diabetes mellitus)
Other types of diabetes mellitus.
Diabetes of pregnant women

Basic diagnostic measures at the outpatient level:

• determination of glycemia on an empty stomach and 2 hours after a meal (with a glucose meter);
• determination of ketone bodies in urine.

Diagnostic criteria:

• thirst;
• frequent urination;
• weight loss;
• itchy skin;
• severe general and muscular weakness;
• reduced working capacity;

• drowsiness

Physical examination:

The clinic is caused by symptoms of insulin deficiency:

• dry skin and mucous membranes;
• reduction of skin turgor;
• "diabetic" blush;
• enlargement of the liver;
• the smell of acetone in the exhaled air;
• shortness of breath;
• noisy breathing.

Up to 20% of patients with type 1 diabetes have ketoacidosis or ketoacidotic coma at the onset of the disease.

Hypoglycemic conditions

• weakness, dizziness
• decreased concentration and attention
• headache
• drowsiness
• confusion
• Slurred speech
• unsteady gait
• seizures
• tremor
• cold sweat
• pallor of the skin
• tachycardia
• increased blood pressure • feeling of anxiety and fear

4.Illustrative material: Presentation

5.References:

1. Emergency conditions in diabetes mellitus. Textbook for doctors / N.I. Gaponova, N.F.Plavunov, V.R.Abdrakhmanov. – M.: [B. I.], 2016. – 107 p.
2. Clinical protocol for diagnosis and treatment of "Diabetes mellitus)".Approved by the Joint Commission on the Quality of Medical Services of the Ministry of Health of the Republic of Kazakhstan dated June 23, 2016. Protocol No. 5.
3. Mkrtumyan A.M., Nelaeva A.A. Emergency endocrinology. - GEOTAR Media. - 2018. – 128 p.

6. Control questions (feedback):

1. What is diabetes mellitus?
2. What types of diabetes do you know?
3. What are the symptoms of diabetes?
4. An algorithm for helping with hypoglycemia.
5. An algorithm for helping with hyperglycemia.
6. What is thyrotoxic crisis?
6. Symptoms of thyrotoxic crisis
7. Principles of emergency care for thyrotoxic crisis.