



ОҢТҮСТІК ҚАЗАҚСТАН <b>MEDISINA          AKADEMIASY</b> «Оңтүстік Қазақстан медицина академиясы» АҚ		 SOUTH KAZAKHSTAN <b>MEDICAL          ACADEMY</b> АО «Южно-Казахстанская медицинская академия»
Department of "Propaedeutics of internal diseases"		47 / 11 ( )
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## LECTURE COMPLEX

### "Cardiorespiratory system in pathology"

Discipline code:	KSP 3302
Title EP:	6B10115 «Medicine»
Amount of study hours/credits:	270 h. (9 credits )
Course and semester of study:	3rd year, V semester
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**Shymkent, 2024**

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The lecture complex is designed in accordance with the working curriculum of the discipline (syllabus) "Cardiorespiratory system in pathology" and discussed at the meeting of the department

The protocol of № 10 " 31 " 05 2024y.

Head of the department, professor d.m.s. Бекмурзаева Е.К. Bekmurzayeva E.K.

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## Lecture №1:

**1. The theme:** The importance of internal diseases in general medical education. Questioning, examination, palpation, percussion and auscultation of patients with diseases of the respiratory system in normal and pathological conditions.

Diagnostic value.

**2. Purpose:** To familiarize students with the introduction to clinical medicine, to give a general idea of diseases of internal organs and tasks of internal medicine, about the basics of medical deontology. To study the principles of general examination of the patient: assessment of consciousness, position, skin and subcutaneous fat, bone and joint system.

To familiarize with the methods of research and semiotics of respiratory lesions. On the basis of the integration of fundamental and clinical disciplines, to teach students the basics of clinical examination of the respiratory organs in normal; to master the skills of examination, palpation of the chest, percussion and auscultation of the lungs.

**3. Lecture abstracts:** A very important point is the ability of a doctor to communicate with a sick person. The relationship between a doctor and a sick person, the duty and duties of a doctor are called medical deontology (Greek deon, deonos-duty, logos — reading). Medical deontology is the observance by medical professionals of ethical rules in the performance of their duties in the profession. Now, taking into account the above, we are going to highlight the main directions on the path of clinical research:

1. disease is a pathological change in the body, therefore it is necessary to distinguish which of them is a pathological change, and which is a reaction of the body.

2. not to consider the disease as a lesion of a separate organ or one system, but to study the function of all physiological systems at that time. The task of determining the type and existence of the disease.


3. Taking into account the principle of unity of the human body and the environment, it is necessary to identify the etiological causes, including taking into account the social, political and social situation.

4. the principle of Nervism, i.e. the establishment of the place of origin and development of diseases of the nervous system, including the nervous system.

## METHODS OF CLINICAL EXAMINATION OF PATIENTS

We divide the symptoms of the disease, that is, the symptoms (from the Greek.symptoma— direct), into subjective and objective. The manifestation of objective changes in the diseased organism in its consciousness (nausea, dizziness, palpitations, pain, etc.) is a subjective sign. And the signs of the disease detected during the examination of the patient (enlarged liver, tumors, cardiac arrhythmia, etc.) are considered objective.



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The inquiry begins first with collecting the patient's complaints. The importance of human feelings in detecting a disease is no less important than an objective examination. Some diagnoses (for example, angina pectoris, or tightness in the chest) are made on the basis of subjective complaints. When the symptoms appeared, what are the first symptoms, the changes that have occurred so far (anamnesis morbi — memories of the development of this disease) will help you diagnose yourself. After the anamnesis of the disease, the history of his life is set (anamnesis vitae — memories of life). The patient's life path consists of his own words or a conversation with relatives. (see the dialogue)

Objective examination of the patient's condition at that time (status praesens) is the main area of examination of a sick person. Along with many research methods — examination, body temperature measurement, palpation, percussion, auscultation-laboratory, X-ray, etc. studies reveal pathological changes in the structure of organs and body systems.


Diagnostic research methods are divided into basic and additional ones. The main clinical methods include examination, examination, palpation, percussion and auscultation of the patient. The doctor should apply them to each disease, and only after that, to confirm the diagnosis, he will choose the necessary additional research methods.

#### INTERVIEWING THE PATIENT

The method of interviewing a patient is also known as "anamnesis collection". "Anamnesis" comes from the Greek word anamnesis — memory. The survey should be conducted in the following order: 1) documents department; 2) complaints; 3) Medical history; 4) Life history of the patient. The reference data includes the surname, first name, patronymic, age, gender, profession, place of residence of the patient. They have their places in the detection of various diseases. For example, peptic ulcer, jaundice, etc., cancer, atherosclerosis, myocardial infarction, etc. are more common at a young age. Therefore, the doctor looks at the age of the patient who came with dyspeptic complaints, and if this is an elderly person, then first he looks for a tumor of the gastrointestinal tract, and a young person has gastritis and peptic ulcer diseases that are lighter than his own. Most often, children suffer from measles, rubella, and whooping cough.

#### PATIENT COMPLAINTS

The patient's complaints should be considered immediately in the main and additional form. Sometimes it is difficult to determine the degree of their significance. An emotional complaint may also not be directly related to the underlying disease. The doctor is obliged to accurately identify each main complaint of the patient. This in itself is an important diagnostic solution. Complaints have a separate place in the feeling of pain inside you. The patient must have a clear answer to the following questions: 1) the location of the pain sensation; 2) its characteristics (acute, chronic, convulsive); 3) strength, or progression — 4) Prevalence,

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transmission; 5) the causes that caused the feeling of pain, the time of its occurrence; 6) measures that enhance or reduce the feeling of pain (physical labor, nervousness, etc.). Pain in the sternum can occur and stop due to physical exertion or spread by nitroglycerin exactly the same way. And the connection of the disease with food intake is P. I., That is, the appearance on an empty stomach, slowing down after eating, helps to identify the presence of gastric ulcer.

### THE HISTORY OF THE DISEASE

When studying the history of the development of a sick person's disease (apates morbi), you should get specific answers to the following questions: 1) When did you start to get sick?; 2) The first signs (symptoms) of the disease; 3) the causes that caused the disease; 4) course, course (intensification, temporary death, newly added and modified symptoms) of the disease; 5) research methods conducted to date, and the treatment received, its conclusions, the effect of treatment

### THE LIFE HISTORY OF THE DISEASE

The patient's life story (apates vitae) is a medical biography reflecting the main stages of his life (infancy, childhood, adolescence, adulthood).

Family and hereditary history. Data on the disease and the causes of death of parents and close relatives are of great importance in diagnosis, especially in predicting the disease. Infectious diseases can be transmitted to several people in the same family, such as tuberculosis. Pathological heredity is often transmitted in the form of a predisposition to a disease that can develop into a disease only under certain conditions. The human body can resist the disease if there is no situation that aggravates the disease.


General vision (inspectio) — this method is very helpful in recognizing various diseases. Doctors sometimes get carried away with other research methods (X-ray, laboratory, instrumental) and do not take into account the crucial importance of physical research methods for the diagnosis of many diseases.

This research method was given special importance in early times, since the doctor had no other examination methods, so he relied only on vision to determine the diagnosis of the patient. Nowadays, various sensitive instrumental methods are widely used. Nevertheless, the methods of physical research have not lost their essence.

Inspection rules. For a complete examination of the patient, the following rules must be observed:

1. The ingress of light into the room where the patient is being examined is conditional. And with daily electric lighting, the yellowing of the skin and mucous membranes of the eyes does not look very good, so in the absence of daylight, it is better to use fluorescent lamps. And for visual detection of various pulses, respiratory movements of the chest, movements of the stomach and intestines, when light falls, pain in the side on which he lies down, sits down, lies down.



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2. The room in which the patient is located should be not only bright, but also warm. The check should be carried out quickly and systematically, trying not to stay naked for a long time. The patient is first examined in a standing position, and then lying down.

3. The warmth of the doctor's hand and the head of the stethophonendoscope should be approximately close to the warmth of the human body.

4. General examination is always desirable to perform with a certain system: first, look alternately at the signs that have a general meaning, and then at the details of the body (head, face, neck, face, limbs, skin, bones, joints, skin, subcutaneous layers, hair, ingrown coating).


The general examination begins with the orientation of consciousness, posture, physique, then the temperature is measured and anthropometric data is collected. The general condition of the patient can be determined by four types: satisfactory (normal), moderate (below normal), severe and agonic (fatal). Then there is a check of the consciousness of the disease.

The state of consciousness is determined by the following types: 1) open consciousness; 2) fuzzy consciousness - the patient cannot determine his environment, although he answered the question correctly. 3) stupor — the patient does not understand his environment, just reacts to snot. 4) sopor — the patient is constantly asleep and reacts only to the fact that he screams from a loud sound, but does not understand the meaning of what is said. 5) coma is an unconscious, unconscious state of the patient, sometimes reflexes also completely disappear.

**Body types.** The physical structure (constitution) of a person is a set of morphological and functional features of the body, which are often transmitted from father to child, but undergo changes under the influence of the environment, especially the social situation. The change in the constitution of the physique occurs in accordance with the function of the nervous and endocrine systems. Therefore, the types of human temperament should also be taken into account here. They are as follows: 1) choleric-hot-tempered, strong character; 2) phlegmatic-restrained, simple character; 3) sanguine-restrained, impetuous character; 4) melancholic-short-tempered, weak character.

Taking into account the morphological and functional features of the human body, Professor M. V. Chernorutsky divided people into three constitutional types: asthenic, normosthenic, hypersthenic.

**Examination of the skin layer.** The complaint that draws attention to the condition of the skin layer is itching. Itching is sometimes associated with changes in the skin (psoriasis), it can also occur as an external manifestation of diseases of internal organs (liver and biliary tract diseases, lymphogranulomatosis), as well as as the first sign of allergic diseases.

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The next thing you should pay attention to is a change in skin color. Pallor and redness of the skin in people with diseases of the autonomic nervous system alternate. And constant pallor of the skin and an increase in pallor are observed every day in the following cases: sudden or gradual bleeding (peptic ulcer, hemorrhoids, gynecological diseases), diseases of the blood system (hemolytic anemia, Werlhoff's disease, etc.), acute and chronic infectious diseases, sepsis, malignant neoplasms, poisoning, etc. But sometimes even a healthy person has a pale face due to poor development of subcutaneous vessels.

Pallor of the skin is also caused by other causes: compression of the skin vessels in kidney diseases; conditions leading to vasoconstriction (fear, fainting, vomiting, hypertensive crisis, frostbite); insufficient blood in the vascular system (narrowing of the aortic mouth, insufficiency of the aortic valve). It is especially worth paying attention to the sudden pallor of the skin, since in these cases (peptic ulcer, peritonitis, etc.) the patient may need assistance. Usually, people with these diseases suddenly turn pale, feel dizzy and lose consciousness, pulse quickens and blood pressure drops.

Pallor can be different. With anemia (Addison-Biermer anemia, hemolytic anemia) caused by hemolysis with slight yellowness of the skin, with chlorosis-greenish, and with malignant neoplasms-earthy. In the case of some diseases, the color of the skin attracts a bruise, which is called a bruise (cyanosis). The dull skin tone is caused by an increased content of previously restored hemoglobin in the blood. There are two different reasons: the first is a deterioration of peripheral blood circulation, the second is a lack of gas exchange in the lungs. Sometimes both of these reasons go hand in hand, that is, they are found in the head of one person.

As a result of the deterioration of cardiac activity, arterial blood flowing from the lungs enters oxygen, however, due to a slowdown in blood circulation in the peripheral blood vessels, more oxygen enters the tissues than usual. As a result, the former restored hemoglobin in the venous blood increases. This mold is called false powdery mildew.

Chest examination


A general examination reveals a large number of symptoms found in respiratory pathology.

Among the main symptoms of severe respiratory failure, a pulmonological patient develops depression of consciousness, which indicates hypoperfusion of the brain. The general type of patient, recovery in bed, skin color and visible cream crust, the presence of edema, the distinctive shape of the last phalanges (fingers in the form of "signal sticks").

Included in the detailed examination:

- \* examination of the nasal cavity;
- \* voice change;
- \* breast view;



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\* assessment of respiratory indicators

Examination of the nasal cavity:

- \* changing the external shape of the nose;
- \* condition of the nasal mucosa;
- \* herpetic rash (observed on the affected side);
- \* method of breathing (with nose, mouth, empty, obstructed);
- \* auxiliary sinuses (soreness during palpation?);
- \* nasal discharge (in small amounts, without, in large quantities, creamy, purulent, bloody);
- \* displacement of the nose wings (yes, no).

Larynx: a change in voice (hoarseness, aphonia) can be a sign of many diseases, in addition, in diseases of the respiratory system (laryngitis, laryngeal tumor, vocal cord polyp, etc.).

Chest

The chest examination should be carried out in strict sequence:

- \* breast type;
- \* breast symmetry;
- \* respiratory excursion (chest circumference measurement);
- \* assessment of respiratory indicators;
- \* type of breathing (thoracic, abdominal, mixed).

During the examination of the patient, the patient should undress naked to the waist, while standing or sitting should receive uniform light from all sides.

Breast Type

Constitutional types: normosthenic, hypersthenic, asthenic.

Criteria for determining the constitutional shape of the breast:

- \* the ratio between front-rear and transverse diameters;
- \* the direction of movement of the walls and collarbones;
- \* the volume of intercostal openings;
- \* clarity of the angle of connection of the trunk and handle (angle of inclination);
- \* the size of the epigastric angle;
- \* the position of the shoulder blade outside the chest.

Variants of normal breast types


◆ Normosthenic:

- the front-back size is larger than the horizontal size;
- the walls are curved downwards, the partitions are not obvious;
- the epigastric angle is 90°.

◆ Asthenic:

- the front-back size is larger than the horizontal size;
- the walls are very low, the partitions are clear;
- epigastric angle below 90°;



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◆ Hypersthenic:

- front-rear size is equal to the horizontal size;
- the walls are arranged horizontally, the partitions are narrow;
- the epigastric angle is more than 90°.

Pathological breast forms

Emphysematous-short, strongly expanded, barrel-shaped, horizontally positioned ribs, rib gaps are greatly enlarged and shoulders are raised (resembling a state of maximum deep breathing), a bulge in the area above the collarbone, chest elasticity decreases during palpation and with percussion a box-shaped percussion sound characteristic of patients with emphysema of the lungs.

Flaccid-very long, flat, the ribs are strongly inclined down, the collarbones are very protruding, the supraclavicular fossa descend (it looks like the restoration of maximum exhalation), which is typical for thinned patients, especially tuberculosis patients.

Rickety, bird's breast — the breast descends from the side, protrudes in front of the breast ("chicken breast") and the areas of the ribs that turn into cartilage, thicken and rough ("meshel tubercles") are found in patients who suffered meshel in early childhood.

A funnel-shaped chest ("boot chest") is a congenital depression of the lower part of the chest.

The boat breast is a congenital oval depression in the upper and middle part of the sternum.


Curvature of the spine: laterally — scoliosis, anteriorly — lordosis, posteriorly — kyphosis and kyphoscoliosis, laterally and posteriorly causes a very pronounced developed asymmetry of the chest (injuries, skeletal abnormalities, tuberculous bone lesions, meshes, etc.).

The symmetry of both halves of the chest is assessed with direct and lateral light, free, normal breathing in front and behind. The symmetry of breathing is performed when looking at the chest from the front and back of the patient against the background of deep breathing movements. Then in front is the location of the rib arches with convenient orientations and their respiratory excursion, and behind is the location of the shoulder blades and their movements during breathing. In patients with asthenic physique, the shoulder blades are narrow, so it is necessary to ask the patient to raise his hand to the back of his head, and his elbow to his side, while the rib arches are well shaped, and when breathing, you can notice a slight delay in one half of the chest. When examining the back, the patient's arm is positioned freely throughout the body. The movements of both halves of a normal breast are symmetrical.

Palpation of the breast. Voice trembling

When palpating the breast, the following are evaluated:

- \* elasticity (resistance);

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- \* voice vibration (unchanged, amplified, attenuated, absent, localization of changes);
- \* location of pain;
- \* Detection of pleural friction noise during stroking;
- \* determination of the degree of excursion-determination of the circumference of the chest within 4 intercostal spaces: on calm breathing, deep inhalation and exhalation.

Depending on the degree of ossification of the costal cartilage, based on the elasticity of the breast, it is determined by the feeling of its carcinoma when pressing on the chest.

Causes of decreased chest elasticity (rigidity):

- \* severe hardening of the lung tissue;
- \* hydrothorax;
- \* emphysema of the lungs;
- \* pleural tumor.

Vocal tremor-when the patient pronounces words that include the sound "R" ("forty-four"), an oscillation occurs, determined by palpation in symmetrical foci from the vocal cords and outside the chest of the lung tissue. At this point, it is necessary to evaluate the conduct of low-frequency sound vibrations. In patients with a low voice timbre, the right half and upper chest, especially in the tip area, the vocal vibration is stronger (the short right bronchus conducts sound more strongly). In women, the vocal tremor is weakly pronounced (associated with a high timbre of the voice).

Vocal vibration is caused by the permeability of the bronchial tree, the density of the lung tissue and the fact that vibrations are more or less dense during the transition from tissue to tissue with the same density (the phenomenon of separation of conductive media, in which vibrations weaken greatly).

The vocal tremor spreads evenly to the symmetrical foci of the right and left breasts, resulting from vibrations of the vocal cords.


## Lecture №2

**1. Topic:** Leading clinical syndromes (compaction of lung tissue, bronchial patency disorders, increased airiness in the lung, presence of fluid and cavities in the lung, respiratory failure) in patients with diseases of the respiratory system.

**2. Purpose:** To study the student to evaluate the pathology of the respiratory organs, as well as important and mandatory points of diagnosis of the presence of pulmonary tissue compaction, bronchial patency disorders, increased airiness in the lung.

To study the student to evaluate the pathology of the respiratory organs, as well as important and mandatory points of diagnosis of the presence of fluid and cavities in the lung and respiratory failure.



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**3. Lecture theses:** A syndrome is a combination of interrelated symptoms caused by a single pathogenesis.

The main pathological syndromes of respiratory pathology include: pulmonary tissue compaction syndrome, bronchoobstructive syndrome, respiratory failure syndrome, lung cavity formation syndrome, accumulation of fluid and air in the pleural cavity.

The syndrome of focal compaction of lung tissue is caused by filling of the alveoli with inflammatory exudate and fibrin, blood, germination of the lung lobe with connective tissue due to a long course of lung inflammation or tumor tissue.

The syndrome of cavity formation in the lung occurs with an abscess or tuberculous cavity, the collapse of a lung tumor, when a large cavity is free of contents, communicates with the bronchus and is surrounded by an inflammatory "roller".

The syndrome of accumulation of fluid in the pleural cavity is observed with hydrothorax or with exudative pleurisy. Accumulation of air in the pleural cavity occurs when the bronchi communicate with the pleural cavity, with chest injury or spontaneous pneumothorax.


The formation of a cavity in the lung occurs as a result of the abscess of pneumonia, in tuberculosis (cavern), as a rule, in the area of lung compaction. Therefore, patients have signs of pulmonary tissue compaction and abdominal symptoms at the same time, and the latter can be detected only in the presence of a smooth-walled, air-containing, communicating with the bronchus, located close to the chest wall of the cavity at least 4 cm in diameter.

Patients complain of coughing with the release, as a rule, of purulent sputum in large quantities ("full mouth"), an increase in body temperature.

Upon examination, it is not possible to identify any changes specific to this syndrome. With a long-term abscess or cavern, the patient may become emaciated due to infectious intoxication.

Reliable physical signs of the cavity are bronchial respiration and large-bubbled wet wheezes, heard in a limited area. Additional research methods. Radiologically, a limited illumination of a rounded shape is detected, usually against the background of ambient dimming. A horizontal fluid level is determined inside the cavity, which shifts when the patient's body position changes.

There may be an accumulation of fluid in one or both pleural cavities. Its nature may be inflammatory (exudate) and non-inflammatory (transudate). The causes of the appearance of exudate are inflammation of the pleura (pleurisy) in tuberculosis and pneumonia, carcinomatosis of the pleura in malignant neoplasm. More often, the defeat is unilateral. The causes of hydrothorax, or accumulation of transudate, in the pleural cavity may be stagnation in the small circle of blood circulation in heart failure or general fluid retention in kidney diseases. The process is more often bilateral and is often combined with peripheral edema, ascites, and hydropericardium.

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With rapid and significant accumulation of fluid, lung atelectasis and respiratory failure syndrome develop. Patients complain of shortness of breath, which increases in the position on the healthy side, a feeling of heaviness in the diseased half of the chest.

Patients often occupy a forced position on the affected side, the affected side may increase slightly in size, lags behind when breathing, intercostal spaces smooth out, even bulge out.

The most important signs are a dull percussion sound over the lower parts of the lungs, lack of breathing and negative bronchophony in the area of dullness. Additional research methods. Radiologically, a homogeneous dimming of the pulmonary field, a displacement of the mediastinum to the healthy side is determined. For diagnostic and therapeutic purposes, a pleural puncture is performed to determine the nature of the available fluid.

**4. Illustrative material:** presentation

**5. Literature:** listed on the last page of the syllabus

**6. Security questions:**

1. What are the main clinical syndromes characteristic of respiratory diseases?
2. In which pathologies does the pulmonary tissue compaction syndrome occur?
3. What percussion changes are characteristic of the lung cavity formation syndrome?
4. What auscultative changes are characteristic of the syndrome of fluid accumulation in the pleural cavity?
5. In which pathologies does the syndrome of air accumulation occur in the pleural cavity?
6. What are the main clinical symptoms characteristic of the syndrome of accumulation of fluid and cavity in the lung?
7. In what pathologies does the syndrome of accumulation of fluid and cavity in the lung occur?
8. What percussion changes are characteristic of the syndrome of formation of a cavity in the lung?
9. What auscultative changes are characteristic of the syndrome of accumulation of fluid in the pleural cavity?


### Lecture №3

**1. Topic:** Questioning, examination, palpation and percussion of patients with pathology of the cardiovascular system. Methods of examination of large and peripheral vessels. Auscultation of the heart is normal and pathological. Diagnostic value.

**2. Objective:** To master the methods of clinical research and semiotics of lesions of the cardiovascular system.

**3. Lecture abstracts:**



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Examination of the apex of the heart and cardiac tremor by palpation. Palpation can determine the fluttering of the apex of the heart, the general heartbeat, pulsations in the heart area, trembling in the chest. To determine the tip of the heart, put the palm of the right hand in the heart area, the fingers should lie between the third and fourth ribs, focusing in the armpit. The palm should press on the tip of the heart. So, having identified the tip of the heart, we must pay attention to its general character. During palpation, the place where the tip of the heart lies, its area, strength, height, elasticity are examined. To do this, use the tip of the three fingers of the right hand mentioned above to accurately determine the point at which the tip of the heart is located. If the thrust of the end of the heart occupies a significant area, we choose the outermost, lowest point. You should ask the patient to keep his chest tilted forward, so it will be more convenient to find the thrust of the end of the heart.

By the area of the heartbeat, we mean the movement of the chest under the influence of a jolt, which under normal conditions has a diameter of 1-2 cm. If it is more than 2 cm wide and smaller, it is considered limited. Disseminated thrust indicates an increase in the size of the heart, a condition that occurs when a person is exhausted, when the intercostal spaces are wide, when the lower part of the left lung contracts. With obesity, lung diseases, and a low diaphragm location, there is a limited form of pushing, that is, the heart meets with a smaller chest volume.


By the height of the heartbeat, we mean the amplitude of the chest vibrations. The height of the heart is divided into two parts: up and down.

When examined by palpation, the pressure exerted by the end of the heart on the fingers is called the force of touching the end of the heart. This is due to a contraction of the left ventricle. Like the two previous properties, the force of the thrust depends on the thickness of the chest and the proximity of the end of the heart to it. More importantly, it corresponds to the force of contraction of the left ventricle.

On palpation, you can notice the elasticity of the heart rate, which means that with hypertrophy, the muscle of the left ventricle thickens, its elasticity increases. And when the left ventricle descends strongly, a " domed " push is felt, because in any case, the heart fits tightly to the chest cavity.

Under normal conditions, the cardiac impulse lies between the fifth rib 1-2 cm to the right of the line of the middle collarbone. If the patient is lying on the left side, this point can move 2 cm to the left, if it lies on the right side, 1-1.5 cm to the right. And when a person stands up straight, there should be no such changes. Extra-cardiac causes also affect the displacement of the cardiac end. These include lifting the chest up, changing the volume of the chest, bulging of the lungs, etc.

Due to increased pressure in the abdominal cavity, the thoracic septum is raised (obesity, pregnancy, etc.). When bending, the tip of the heart shifts to the left, rises up and lies horizontally. On the contrary, when the thoracic septum is lowered (lowering of pressure in the abdominal cavity, emphysema of the lungs, asthenic

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type of body structure, lethargy, visceroptosis), it decreases. All this affects the vertical position of the three hearts turned down to the right.

The pressure may increase in one part of the cavity of the pulmonary sac, which most often occurs when fluid accumulates, as with it (exudate pleurisy, unilateral hydrothorax, hemothorax), when the heart shifts in the opposite direction. At this point, the thrust of the end of the heart is also shifted accordingly.

When the lungs bulge, decrease in size and with obstructive cholectasis (malignant neoplasms, foreign bodies that have spread from the bronchi to the lungs), the tip of the heart shifts to the side changed by the processes of pathology. The expansion and thickening of the left ventricle due to heart diseases (aortic valve defect, insufficiency of the bicuspid valve function, increased blood pressure in the large circulation, atherosclerosis, cardiosclerosis) shifts the thrust of the end of the heart to the left, due to a lack of function of the aortic valve, it moves to the left and down. In congenital anomalies, if the abdominal cavity is located on the opposite side (situs visceruminversus), the heart lies on the right side, so the heart lift is also on the right side.

What is especially important is that if a lot of kisses accumulate in the heart sac, touching the heart tip is not felt at all, and it does not correspond to relative closeness. When fluid accumulates in the cavity of the left pulmonary sac (exudative pleurisy, hydrothorax, hematorox), the fluttering of the end of the heart is not felt.

When the shell of the heart is attached to the chest, at this moment in the systole phase, it is observed that the heart is moving backwards rather than moving forward, calling such a push a negative push of the end of the heart.

In addition to pressing on the tip of the heart, it is also necessary to pay attention to pressing on the heart, which describes the function of the right ventricle. This push is not observed in healthy people, so it is very difficult to detect. The cardiac impulse is determined by palpation in the ventricle (hypertrophy) and dilation (dilation).

Of great diagnostic importance is the definition of the symptom "cat purring" (flemissement sateare — cat purring), written by French scientists. The reason why it is called: if you palpate the heart, you will feel a tingling sensation that manifests itself when stroking the cat's back. This symptom occurs when the mitral orifice narrows in the diastole phase, when its valve narrows in the aortic systole phase, due to uncovered pulmonary artery or the Battala canal in the pulmonary trunk.


**4. Illustrative material:** presentation.

**5.Literature:** listed on the last page of the syllabus

**6. Security questions:**

1. What is a chest toad?
2. What are the causes of a heart hump?
3. How is the visible apical shock formed and where is it localized?
4. How is relative cardiac dullness determined?
5. What is absolute cardiac dullness determined for?



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## Лекция №4

**1. Topic:** Leading clinical syndromes: high blood pressure and ischemic heart disease, acute and chronic coronary insufficiency, lesions of the valvular apparatus in patients with diseases of the cardiovascular system.


**2. Purpose:** To teach students to identify the main symptoms of hypertension, the causes of hypertension and coronary heart disease. To explain the mechanism of development of symptoms and identify changes typical for this disease in laboratory and instrumental studies of the patient. To teach students the collection of complaints and anamnesis, the method of targeted examination of a patient with coronary insufficiency and the identification of symptoms typical of this disease and changes in laboratory and instrumental research methods.

### 3. Lecture abstracts:

Hypertension is one of the most common human diseases. Hypertension occurs in 25% of men aged 40-50 years. In this kind of research, more than 40% of hypertension is detected for the first time, although in many cases there are also obvious changes on the part of target organs. These circumstances once again convince us of the need to measure blood pressure in everyone who goes to the clinic for one reason or another.

In healthy people, blood pressure is within strictly defined limits, which is determined by the physiological interaction of the heart, vascular system and functional systems regulating their activity (nervous and humoral). The blood pressure level is determined, on the one hand, by the magnitude of cardiac output, depending on the state of systolic and diastolic functions of the heart, and on the other - on the resistance provided by the arterial vascular bed to blood flow (total peripheral arterial vascular resistance - OPSS). Therefore, the mechanisms responsible for an increase in blood pressure may be either an increase in heart rate, or an increase in cardiac output that is inadequate to the level of vascular resistance, or a combination of them. An increase in intravascular and extravascular fluid volume is of particular importance. When analyzing the mechanism of increasing blood pressure, attention should also be paid to the extensibility of large arterial vessels and the state of tone of the venous system, which affects the return of blood to the heart, and consequently, to cardiac output.

The value of blood pressure is affected by the state of the autonomic nervous system, especially the sympathetic one, the effects of hormonal and other biologically active substances (including atrial natriuretic factor, bradykinins, etc.), the activity of arterial bar or pressor receptors, endothelial relaxing and vasoconstricting factors, etc. Naturally, the well-coordinated interaction of these latter determines the relative stability of blood pressure and the adequacy of its adaptive deviations. Equally important is the role of heredity, which determines the reactivity of the circulatory system to a variety of stimuli. Currently, there are grounds to recognize that hypertension is a polygenal disease.

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Damage to the heart muscle can be observed in a number of pathological conditions: myocardial infarction, myocarditis, myocardial dystrophy, cardiosclerosis, cardiomyopathy. All these conditions are characterized by a well-defined, different clinical picture, but they also have some common signs that can be combined into a syndrome of heart muscle damage.

As is known, the myocardium has a number of specific functions. These are automatism, excitability, conductivity and contractility. Depending on the location of the lesion of the heart muscle, various manifestations of this syndrome may occur. Thus, when the conduction system of the heart is affected, various arrhythmias are observed, and the defeat of cardiomyocytes leads to pain and a decrease in the contractility of the heart. The latter leads to the development of heart failure syndrome, the manifestations of which were described earlier.

Patients with a lesion of the heart muscle may complain of pain, unpleasant sensations in the heart of a diverse nature, palpitations, interruptions in the work of the heart. Pain can be angina pectoris (constricting, paroxysmal, localized behind the sternum, radiating to the left arm, under the shoulder blade), as well as aching, stabbing, prolonged, with localization mainly at the apex of the heart, as a rule, without irradiation.

The examination reveals signs characteristic of circulatory insufficiency (described in the previous section).

The most reliable signs of damage to the heart muscle are: an arrhythmic pulse, an outward shift of the left border of relative cardiac dullness, a weakening of the I tone at the apex and systolic noise that does not extend beyond the projection of the heart, as well as a "pendulum-like" rhythm or "gallop rhythm".

The electrocardiogram shows various rhythm and conduction disturbances, as well as signs of coronary circulatory insufficiency.

Radiologically, there is an expansion of the shadow of the heart in diameter, weakened, sometimes arrhythmic pulsation.


Echocardiographic examination makes it possible to determine violations of the general and local contractility of the myocardium (hypokinesia, akinesia, dyskinesia), its hypertrophy or thinning, dilation of the heart cavities, and associated valve insufficiency.

Coronary insufficiency syndrome is one of the most leading problems in medical practice due to its impact on the patient's health, as well as due to the risk of fatal conditions, diagnostic difficulties, and social significance.

The pathomorphological basis of coronary insufficiency is atherosclerosis of the coronary arteries, leading to absolute or relative insufficiency of coronary circulation, the development of coronary artery disease.

In coronary syndrome, acute and chronic forms are distinguished. Acute forms include unstable angina pectoris; first-time angina pectoris; progressive, with increased frequency, longer duration of seizures, decreased exercise tolerance,



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insufficient effectiveness of antianginal therapy; acute myocardial infarction; early postinfarction angina pectoris. Chronic forms: angina pectoris of tension: angina pectoris of rest.

Coronary heart disease is an acute or chronic lesion of the heart muscle caused by a mismatch between the myocardial oxygen demand and its delivery due to narrowing of the lumen of the coronary arteries of the heart.

Atherosclerotic changes in coronary vessels increase the tendency to coronary spasm. Such vessels do not respond to vasodilating effects. With a decrease in the lumen of the vessel by 30-45%, the maximum blood flow begins to decrease. Narrowing of the main trunk of the left coronary artery by 50%, possibly the appearance of ischemic attacks.

**4. Illustrative material:** presentation

**5. Literature:** listed on the last page of the syllabus

**6. Security questions:**

1. What blood pressure figures correspond to arterial hypertension?
2. What changes during auscultation can be detected in patients with coronary heart disease?
3. What changes on the ECG can be detected in coronary heart disease?
4. What indicators of arterial hypertension relate to borderline arterial hypertension?
5. What are the main complaints of hypertension and coronary heart disease?
6. What is coronary insufficiency syndrome?
7. What are the causes of coronary insufficiency?
8. What forms of coronary insufficiency do you know?
9. What is atherosclerosis?
10. What applies to acute forms of coronary insufficiency?