LECTURE COMPLEX

Discipline: “Respiratory system in pathology”
Course code: RSP 3305
Title and code of the OP: 6B10115 "Medicine"
Amount of study hours/credits: 150 hrs. (5 credits)
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The lecture complex was developed in accordance with the working curriculum of the discipline (sillabus) and discussed at a department meeting.

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Head of department, d.m.s., professor Bekmurzaeva E.K. _____

Lecture №1:

1. Subject: Questioning, examination, palpation and percussion of patients with respiratory diseases in norm and pathology. Diagnostic value.

2. Target: To familiarize students with 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. Based on the integration of fundamental and clinical disciplines, to teach the basics of clinical examination of the respiratory organs in health and pathology, to master the skills of examination, palpation and percussion of the chest.

3. Lecture abstracts:

A very important point is the doctor's ability to communicate with a sick person. The relationship between a doctor and a sick person, the duty and obligations of a doctor are called medical deontology (Greek deon, deonos - duty, logos - reading). Medical deontology is the observance of ethical rules by medical workers in the performance of their professional duties.

METHODS OF CLINICAL EXAMINATION OF PATIENTS

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

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

An objective examination of the patient's condition at that moment (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 and other studies reveal pathological changes in the structure of organs and body systems.

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

PATIENT SURVEY

The method of questioning the patient is also known as "anamnesis". "Amnesis" comes from the Greek word anamnesis - recollection. The survey should be conducted in the following order: 1) the document department; 2) complaints; 3) Medical history; 4) The patient's life history. Reference data include the patient's surname, name, patronymic, age, gender, profession, place of residence. They have their place in identifying various diseases. For example, at a young age, peptic ulcer disease, jaundice, etc., cancer, atherosclerosis, myocardial infarction, etc. are more common. 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 in a young person - milder than him, gastritis, ulcerative diseases. Most often, children suffer from measles, rubella, whooping cough.

PATIENT COMPLAINTS

The patient's complaints should be considered in both their main and additional forms. Sometimes it is difficult to determine their significance. A complaint expressed with emotions may also not be directly related to the underlying disease. The physician must accurately determine each main complaint of the patient. This in itself is an important diagnostic decision. The patient must have a clear answer to the following questions: 1) the location of the pain; 2) its characteristics (acute, chronic, convulsive); 3) strength or progression - 4) prevalence, transmission; 5) causes that caused the feeling of pain, time of its occurrence; 6) measures that increase or decrease the feeling of pain (physical labor, nervousness, etc.). Pain in the sternum can arise and stop due to physical exertion or spread with nitroglycerin. And the connection of the disease with food intake, i.e. the appearance on an empty stomach, slowing down after eating, helps to identify the presence of gastric ulcer.

HISTORY OF DISEASE DEVELOPMENT

When studying the history of the development of the disease of a sick person (anagnes morbi), it is necessary to obtain specific answers to the 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) The course, progression (intensification, temporary death, newly added and changed symptoms) of the disease; 5) The research methods conducted to date and the treatment received, its conclusions, the impact of the treatment.

LIFE HISTORY DISEASE

The patient's life history (anamnes vitae) is a medical biography that reflects the main stages of his life (infancy, childhood, adolescence, maturity).

Family and hereditary history. Data on the disease and causes of death of parents and close relatives are of great importance in diagnostics, especially in prognosticating the disease. Infectious diseases can be transmitted to several people in one family, for example, tuberculosis. Pathological heredity is often transmitted as a predisposition to a disease, which 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 (radiological, laboratory, instrumental) and do not take into account the decisive importance of physical research methods for diagnosing many diseases.

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

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

1. The light entering the room where the patient is 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 daylight lamps. And for visual detection of various pulses, respiratory movements of the chest, movements of the stomach and intestines, when the light falls, pain in the side on which he lies, sits, lies.
2. The room in which the patient is located should not only be light but also warm. The examination should be carried out quickly and systematically, trying not to remain 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 stethoscope head should be approximately equal to

the warmth of the human body.

4. It is always advisable to carry out a general examination with a certain system: first, look in turn at the signs that have a general meaning, and then at the body parts (head, face, neck, face, limbs, skin, bones, joints, skin, subcutaneous layers, hair, ingrown hairs).

General examination begins with orientation of consciousness, posture, body type, then temperature is measured and anthropometric data is collected. General condition of the patient can be defined by four types: satisfactory (normal), moderate (below normal), severe and agonic (fatal). Then comes the check of consciousness of the disease. The state of consciousness is determined by the following types: 1) open consciousness; 2) unclear consciousness - the patient cannot determine his surroundings, although he answered the question correctly. 3) stupor - the patient does not understand his surroundings, 4) sopor - the patient is constantly asleep and reacts only to what is screaming from a loud sound, but does not understand the meaning of what is said. 5) coma - 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 characteristics of the body, which are often passed on from father to child, but undergo changes under the influence of the environment, especially the social situation. Changes in the constitution of the body occur in accordance with

function of the nervous and endocrine systems. Therefore, here we should also take into account the types of human temperament. They are as follows: 1) choleric - hot-tempered, strong character; 2) phlegmatic - reserved, simple character; 3) sanguine - reserved, impetuous character; 4) melancholic - hot-tempered, weak character.

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

Skin layer examination. A complaint that draws attention to the condition of the skin layer is skin itching. Skin itching is sometimes associated with changes in the skin (psoriasis), and can also occur as an external manifestation of diseases of the internal organs (liver and bile duct diseases, lymphogranulomatosis), as well as the first sign of allergic diseases.

The next thing to pay attention to is the change in skin color. Paleness and redness of the skin alternate in people with diseases of the autonomic nervous system. And constant paleness of the skin and an increase in pallor every day are observed in the following cases: sudden or gradual bleeding (peptic ulcer, hemorrhoids, gynecological diseases), diseases of the blood system (hemolytic anemia, Werlhof'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.

Pale skin can also be caused by other reasons: compression of skin vessels due to kidney disease; conditions leading to vascular constriction (fear, fainting, vomiting, hypertensive crisis, frostbite); blood deficiency in the vascular system (narrowing of the aortic orifice, aortic valve insufficiency). Particular attention should be paid to sudden pale skin, since in these cases (peptic ulcer, peritonitis, etc.) the patient may require assistance. Usually, with these diseases, people suddenly turn pale, feel dizzy and lose consciousness, their pulse quickens and blood pressure drops.

Pallor can be different. In anemia (Addison-Birmer anemia, hemolytic anemia), caused by hemolysis with slight yellowness of the skin, in chlorosis - greenish, and in malignant neoplasms - earthy color. In the case of some diseases, the color of the skin attracts a bruise, which is called a bruise (cyanosis). The dull shade of the skin is due to an increased content of previously restored hemoglobin in the blood. There are two different reasons: the first is deterioration of peripheral circulation, the second is insufficient 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 into oxygen, but due to the slowdown of blood circulation in the peripheral blood vessels, more oxygen than usual enters the tissues. As a result, the former restored hemoglobin in the venous blood increases. This mold is called downy mildew.

Chest examination

A general examination reveals a large number of symptoms that are found in respiratory pathology. Among the main symptoms of severe respiratory failure in a pulmonary patient, depression of consciousness develops, which indicates cerebral hypoperfusion. To the general type of the patient, recovery in bed, color
skin and visible creamy crust, the presence of edema, the distinctive shape of the last phalanges (fingers in the form of “signal sticks”).

Included in detailed consideration:

* examination of the nasal cavity;
* voice change;
* breast examination;
* Assessment of respiratory parameters Examination of the nasal cavity:
* change in the external shape of the nose;
* condition of the nasal mucosa;
* herpetic rash (observed on the affected side);
* breathing method (through nose, mouth, empty, difficult);
* accessory nasal sinuses (pain on palpation?);
* nasal discharge (in small quantities, without, in large quantities, creamy, purulent, bloody);
* displacement of the wings of the nose (yes, no).
* Larynx: a change in voice (hoarseness, aphonia) can be a sign of many diseases, in addition to diseases of the respiratory system (laryngitis, laryngeal tumor, vocal cord polyp, etc.).

Rib cage

Examination of the chest should be carried out in strict sequence:

* breast type;
* breast symmetry;
* respiratory excursion (measuring chest circumference);
* assessment of respiratory parameters;
* breathing type (thoracic, abdominal, mixed).

When examining a patient, the patient should be naked to the waist, and when 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:

* ratio between the anterior-posterior and transverse diameters;
* direction of movement of walls and clavicles;
* volume of intercostal spaces;
* clarity of the angle of connection between the body and the handle (angle of inclination);
* epigastric angle size;
* position of the shoulder blade outside the chest.

Variations of normal chest types

♦ Normosthenic:

- the front-back dimension is larger than the horizontal dimension;

- the walls are curved downwards, the partitions are not obvious;
- epigastric angle 90°.

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

♦ Hypersthenic:
- front-back dimension is equal to the horizontal dimension;
- the walls are horizontal, the partitions are narrow;
- epigastric angle greater than 90°.

Pathological forms of breasts

♦ Emphysematous - short, greatly expanded, barrel-shaped, horizontally located ribs, costal spaces are greatly enlarged and the shoulders are raised (resembling the state of maximum deep breathing), a bulge in the area above the collarbone, decreased elasticity of the chest upon palpation and a box-shaped percussion sound upon percussion, characteristic of patients with pulmonary emphysema.

♦ Flabby - very long, flat, ribs strongly inclined downwards, clavicles very protruding forward, supraclavicular fossae descend downwards (similar to restoration of maximum exhalation), which is typical for patients who have lost weight, especially those with tuberculosis.

♦ Rickety, bird's breast - the chest droops at the side, protrudes in front of the sternum ("chicken breast") and the areas of the ribs that pass into the cartilage are thickened and rough ("meschel tubercles"), found in patients who suffered from meschel in early childhood.

♦ Funnel chest ("boot chest") -congenital depression of the lower part of the chest.

♦ Boat chest is a congenital oval depression in the upper and middle part of the sternum.

♦ Spinal curvature: laterally - scoliosis, anteriorly - lordosis, posteriorly - kyphosis and kyphoscoliosis, laterally and posteriorly causes very pronounced developed asymmetry of the chest (trauma, skeletal anomalies, tuberculous bone lesions, meshels, etc.). The symmetry of both halves of the chest is assessed in direct and lateral light, free, normal breathing in front and behind. The symmetry of breathing is carried out when looking at the chest from the front and behind the patient against the background of deep respiratory movements. Then in front - the location of the costal arches with convenient orientations and their respiratory excursion, and behind - 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 the head, and the elbow to the side, while the costal arches have a good shape, and when breathing, you can notice a slight delay in one half of the chest. When examining the back, the patient's hand is freely located throughout the body. The movements of both halves of a normal breast are symmetrical.

Palpation of the chest.

Vocal tremor during palpation of the chest is assessed:

* elasticity (resistance);
* voice vibration (unchanged, increased, decreased, absent, localization of changes);
* location of pain;
* detection of pleural friction noise when stroking;
* Determining the degree of excursion - determining the circumference of the chest within 4 intercostal spaces: during 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 sensation of its carcinoma when pressing on the chest.

Causes of decreased elasticity of the chest (rigidity):

* severe hardening of lung tissue;
* hydrothorax;
* pulmonary emphysema;
* pleural tumor.

Vocal fremitus - when the patient pronounces words that include the sound "R" ("forty-four"), there is an oscillation 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 conduction of low-frequency sound vibrations. In patients with a low voice timbre, the right half and upper part of the chest, especially in the tip area, the vocal vibration is stronger (the short right bronchus conducts sound stronger). In women, vocal fremitus vibration is weakly expressed (associated with a high voice timbre).

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

Vocal fremitus is evenly distributed across symmetrical areas of the right and left chest, arising as a result of vibrations of the vocal cords.

Percussion of the lungs— is a method of physical examination in which light blows are applied to the surface of the chest to assess the condition of the underlying tissue. Percussion allows one to judge the airiness of the lung tissue, the presence of fluid or compaction, and the displacement of the lung boundaries.

Lung percussion technique

The patient stands or sits with arms crossed over the chest.

Percussion is performed symmetrically, comparatively (left/right side).

They start from top to bottom, along the intercostal spaces.

Compare sounds at the same level on the right and left.

Topographic percussion of the lungs

Determining the topography of the lungs requires superficial, quiet percussion.

Determining the height of the apex of the lungs from the front.

Determining the height of the apex of the lungs from behind.

Determination of the width of the Krenig fields - the zone of pulmonary percussion sound above the apices.

Determining the lower boundaries of the lungs - percussion is performed along all lines from top to bottom.

Determination of the mobility of the lower edge of the lungs

Comparative percussion of the lungs

Comparative percussion is performed to identify significant changes in the physical properties of the lungs.

Above the anterior sections of the lungs.

Above the lateral sections of the lungs.

Above the posterior parts of the lungs.

The sonority scale is the distribution of pulmonary sound by loudness, duration and height over the posterior and anterior sections of the lungs.

4. Illustrative material:presentation.

5. Literature: Akhmetov, K. Zh. Zh. Akhmetov. - Almaty: New book, 2022. - 266 p.

6. Control questions (feedback):

1. What is disease?

2. Name the causes of diseases.
3. Name the inspection rule.
4. What signs should you pay attention to when examining a patient's skin?
5. What are the main and additional complaints of patients with respiratory diseases?
6. What is a cough?
7. Name the types of chest.
8. What is palpation?
9. Describe chest percussion.
10. Technique for palpation of the chest.
11. Technique for performing comparative pecussion of the chest.
12. Technique for performing topographic pecussion of the chest.

Lecture No. 2

1. Topic: Auscultation of the chest in patients with respiratory diseases in norm and pathology.

2. Objective: To familiarize students with 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. Based on the integration of fundamental and clinical disciplines, teach the basics of clinical examination of the respiratory organs in health and pathology, master the skills of examination, auscultation of the chest.

3. Lecture theses:

Auscultation of the lungs is a physical diagnostic method in which the doctor listens to the sounds emitted by the lungs and bronchi to assess their condition and identify pathologies. It is an important component of the examination of the respiratory system, allowing to identify various diseases, such as bronchitis, pneumonia, asthma and others. Auscultation of the lungs is an important procedure that allows the doctor to assess the health of the respiratory system by listening to the sounds emitted by the lungs and bronchi. Using a stethoscope, the doctor can identify various anomalies and changes that may indicate the presence of respiratory diseases or other pathologies.

How is lung auscultation performed:

1. Preparation: The patient should be calm, sitting or lying down, arms should be down.
2. Stethoscope: The doctor uses a stethoscope to listen to the sounds of the lungs.
3. Listening: The doctor listens to all areas of the chest, starting from the tops of the lungs, then moving to the sides and back surfaces.
4. Sound assessment: The physician assesses the nature and intensity of respiratory sounds, the presence or absence of wheezing, pleural friction rub, and other pathological sounds.

Normal sounds on auscultation: Vesicular breathing:

This is the basic sound of normal breathing, quiet, soft and non-specific.

Bronchovesicular breathing:

Sounds during the exhalation phase may be somewhat louder and longer lasting.

Bronchial breath sounds: This is a louder, harsher sound that is usually heard over the trachea and large bronchi.

Pathological sounds on auscultation:

Wheezing: Sounds produced when air passes through narrowed or inflamed bronchi. Wheezing occurs due to changes in the patency of the airways. The main mechanisms of their formation include:

Narrowing of the airway lumen, which may be caused by bronchospasm, inflammation or swelling of the mucous membrane.

The presence of fluid or phlegm in the bronchi or alveoli causes the air flow to create characteristic sounds.

Airway obstruction is a partial or complete blockage of the bronchi by foreign bodies, tumors, or mucus.

Tissue vibration. Damaged or inflamed areas of the mucous membrane may vibrate when air passes through. Wheezing is classified by several parameters, such as localization, sound character, and conditions of its occurrence.

Wheezing on inhalation. "Squeaky" or "shooting" sounds heard mainly on inhalation usually indicate problems in the upper respiratory tract (pharynx, larynx and upper part of the trachea) or large bronchi. Inspiratory wheezing (high-pitched whistling sound, so-called stridor) occurs when the lumen of the airways narrows in this area, which leads to turbulent air flow. Diseases that cause wheezing on inhalation include: laryngitis, tracheitis, laryngeal edema, upper respiratory tract obstruction (foreign body, tumor, etc.). For physiological reasons, inspiratory wheezing is more common in children than in adults.

Wheezing on exhalation. This sound phenomenon occurs when air passes through narrowed or partially blocked lower respiratory tract (lower part of the trachea, bronchi and bronchioles) due to accumulation of fluid or sputum. Pathological processes that cause wheezing on exhalation: bronchial asthma, chronic obstructive pulmonary disease (COPD), pneumonia, bronchitis, etc.

Wheezing can be dry or wet.

Dry wheezing sounds like a whistling or buzzing sound, as if air were passing through a narrow tube. They occur when the bronchi narrow and are characteristic of conditions associated with increased reactivity of the respiratory tract. Diseases that cause dry wheezing include: bronchial asthma, inflammatory processes, accumulation of viscous sputum, tuberculosis (rare).

Taking into account these mechanisms, it is possible to explain why wheezing occurs in various diseases of the respiratory system and other organs.

Common upper respiratory tract diseases caused by viral or bacterial infections, less commonly by allergic reactions or irritation of the mucous membrane (for example, when inhaling cold air or toxic substances):

laryngitis - inflammation of the larynx often results in a high-pitched whistling sound when inhaling;

pharyngitis - inflammation and swelling of the mucous membrane of the pharynx makes it difficult for air to pass through and creates conditions for wheezing;

tracheitis - inflammation of the trachea is often accompanied by a dry cough and dry wheezing that can be heard when inhaling.

Diseases of the bronchopulmonary system:

bronchitis (acute and chronic) – inflammation in the bronchial wall and production of sputum;

pneumonia – accumulation of sputum in the bronchi (in the early stages of the disease, moist rales are often heard, and in the resolution stage they may disappear);

bronchial asthma - dry wheezing occurs due to narrowing of the bronchial lumen, bronchospasm;

chronic obstructive pulmonary disease - chronic inflammation and narrowing of the small bronchi lead to the appearance of wheezing, especially on exhalation;

benign or malignant neoplasms in the respiratory tract - wheezing increases as the tumor grows;

pulmonary tuberculosis - wheezing may occur due to damage to the tissues of the lungs and bronchi.

Other medical conditions that can cause wheezing include:

allergic reactions (anaphylactic shock, allergic bronchitis) – narrowing of the airways and swelling of the larynx under the influence of an allergen;

heart failure and pulmonary edema - congestion in the pulmonary circulation leads to fluid

accumulation in the bronchi;
additional possible causes of wheezing from the cardiovascular system: myocardial infarction, mitral stenosis, pulmonary hypertension, pulmonary embolism and congenital heart defects;
Crepitation is a distinctive sound, similar to wheezing or crackling, that occurs in the alveoli filled with fluid or secretion and is characteristic of inflammatory processes such as pneumonia. Crepitation indicates active inflammation, while moist rales in the same disease may indicate that the patient is recovering.
Pleural friction rub: A noise produced by friction between the pleural layers.
Pleural friction rub occurs when the inflamed or scarred pleural sheets rub against each other during breathing. This sound resembles the friction of silk or the creaking of leather and is not a classic wheeze. Diseases that cause pleural friction rub include pleurisy, tuberculosis, and chest trauma. This sound differs from crepitus and moist rales in its location and conditions of occurrence.

4.Illustrative material:presentation

5. Literature: Akhmetov, K. Zh. Zh. Akhmetov. - Almaty: New book, 2022. - 266 p.

6. Test questions:

1. What are the main clinical syndromes characteristic of respiratory diseases?
2. What are the main noises?
3. When weak vesicular breathing occurs.
4. Reasons leading to the appearance of a wet whistle.
5. Causes of dry wheezing
6. How do wet rales differ from creaking and friction noises?
7. What is crepitation?
8. What is the mechanism of development of pleural friction rub?

Lecture No. 3

1. **Topic: Leading clinical syndromes of the respiratory system: compaction of lung tissue, impaired bronchial patency.**
2. **Target**: To teach students to identify the main symptoms of lung tissue compaction, bronchial obstruction. To explain the mechanism of symptom development and to identify changes typical for this disease in laboratory and instrumental examination of the patient. To teach how to collect complaints and anamnesis, the method of targeted examination of a patient with symptoms of lung tissue compaction, bronchial obstruction and to identify symptoms and changes typical for this disease in laboratory and instrumental examination methods.
3. **Lecture abstracts:**

Pulmonary tissue consolidation syndrome is the formation of compaction foci in the lungs that are surrounded by normal pulmonary parenchyma. The pathogenesis of this disease involves a decrease in the airiness of the lungs as a result of filling their cells with fluid. Patients suffering from pulmonary tissue consolidation syndrome present the following complaints:
attacks of shortness of breath that occur during exhalation;
frequent paroxysmal cough with the release of a large amount of purulent sputum;
pain in the chest area can only appear in the case of joint involvement of the parietal pleura in the inflammatory process.
During an objective examination of the patient, pronounced pallor and slight cyanosis of the skin are visible, herpetic rashes and facial redness may appear. An informative method of research and widely used to establish a final diagnosis is an X-ray examination of the chest. The results of a general blood test reveal changes in the blood cells, directed towards a pronounced inflammatory reaction
Compaction of lung tissue is a decrease in its airiness. Normally, the alveoli are filled with air.

When compacted, air is replaced by:
Inflammatory exudate
With blood
Cells (eg, tumor cells)
Fibrous tissue
Edema (plasma fluid)
It also occurs when lung tissue collapses (atelectasis).

The most common cause of the development of compaction of lung tissue is pneumonia. Pneumonia is an acute lung disease, which is characterized by an increase in pronounced inflammatory reaction against the background of persistent bacterial infection. With this disease, there is a pronounced process of exudation in the alveolar cells.

It is customary to distinguish the following types of pneumonia:

Non-hospital form of pneumonia that develops in non-hospital conditions, accompanied by pronounced symptoms of fever and signs of inflammation in the upper respiratory tract. Etiological pathogens of this form of pathology can be any infectious and bacterial pathogens.

Reasons
Infectious
Pneumonia (pneumococcus, legionella, COVID-19, etc.)
Tuberculosis
Fungal infections (aspergillosis, histoplasmosis)
Non-infectious
Pulmonary edema (left ventricular failure)
Pulmonary infarction
Vasculitis (eg, Wegener's granulomatosis)
Idiopathic pulmonary fibrosis
Oncological
Lung cancer (central/peripheral)
Lymphoma
Metastases (melanoma, breast cancer, etc.)

Pulmonary tissue consolidation syndrome is an important clinical and radiological sign that requires a comprehensive assessment. It may indicate both benign inflammatory processes and malignant tumors. Clarification of the cause is the task of the doctor, relying on the clinical, radiological and laboratory data.

Bronchial obstruction is a clinical syndrome that is one of the forms of respiratory failure that occurs as a result of obstruction of the bronchial tree, leading to inadequate pulmonary ventilation and difficulty in removing mucus from the bronchi. The cause of this syndrome can be a variety of pathological conditions, such as aspiration of foreign objects, exposure to toxic substances, an attack of bronchial asthma, obstructive bronchitis and other pathologies of the respiratory tract. The condition can develop acutely, for example, in the presence of a foreign body in the bronchi, or during an attack of bronchial asthma, or slowly progress, for example, in chronic obstructive pulmonary disease.

Among the common causes of broncho-obstructive syndrome, we can highlight:
foreign objects in the respiratory tract
attack of bronchial asthma
obstructive bronchitis
various pathologies of the respiratory tract
exposure to toxic substances
tuberculosis

cardiovascular diseases
respiratory viral infection
Signs of bronchial obstruction:
An attack of suffocation with shortness of breath (increased breathing rate), difficulty breathing when exhaling, in severe cases accompanied by fear and the inability to remain in a lying position.
Dry paroxysmal cough. ...
Night attacks of dry cough or suffocation.
Bronchospasm (Latin: bronchospasm) is a narrowing of the lumen of small bronchi and bronchioles; it occurs with various diseases of the respiratory system (for example, with bronchial asthma or bronchitis), manifestations of allergic reactions or damage by toxic substances, complications during surgical interventions.
Diagnostics:
Auscultation of the lungs (wheezing, weakened breathing)
Spirometry (decrease in FEV1, Tiffeneau index)
Chest X-ray
Bronchoscopy (if a tumor or foreign body is suspected)
CT scan of the chest
Bronchodilator test (to determine reversibility of obstruction)
1. By the obstruction mechanism:
Intraluminal causes:
Sputum, mucus
Blood clots
Foreign body
Tumor growing into the lumen
Intramural (in the bronchial wall):
Swelling of the mucous membrane (due to inflammation, allergies)
Hypertrophy of the muscular layer
Tumor growth
Extrabronchial (external compression):
Enlarged lymph nodes (tuberculosis, lymphoma)
Tumors of the mediastinum
Aortic aneurysm
Obstruction of the bronchi leads to:
Difficulty in ventilation - normal gas exchange is disrupted.
Increased resistance to air flow - especially when exhaling.
Hypoventilation and hypoxia - especially in the lower parts of the lungs.
Hypercapnia - with severe and long-term obstructions.
Atelectasis is the collapse of a section of the lung due to a blockage of the bronchus.
Bronchial obstruction requires an individual approach, taking into account the cause, severity of symptoms and age of the patient, especially in children. Without timely correction, such conditions can lead to respiratory failure and other serious complications.

4. **Illustrative material:** presentation.
5. **Literature:** Akhmetov, K. Zh. Zh. Akhmetov. - Almaty: New book, 2022. - 266 p.
6. **Test questions:**

1. What is pulmonary tissue compaction (infiltration) syndrome?
2. What are the main causes of compaction of lung tissue?
3. What are the symptoms of pulmonary tissue consolidation syndrome?
4. What is revealed during auscultation of the lungs in this syndrome?

5.What percussion changes are typical for pulmonary tissue consolidation syndrome?
6.What breathing sounds are characteristic of compaction of lung tissue?
7.What is the phenomenon of vocal fremitus and how does it change with compaction?
8. What are the main causes of bronchial obstruction?
9. What symptoms are characteristic of bronchial obstruction syndrome?

Lecture No. 4

1.Topic: Leading clinical syndromes of the respiratory system: increased airiness, presence of fluid and cavity in the lung. Acute and chronic respiratory failure. Diagnostic value.

2. Target: To teach students to identify the main symptoms of increased airiness, the presence of fluid and a cavity in the lung, acute and chronic respiratory failure. To explain the mechanism of symptom development and to identify changes typical for this disease in laboratory and instrumental examination of the patient. To teach how to collect complaints and anamnesis, the method of targeted examination of a patient with symptoms of compaction of lung tissue, impaired bronchial patency and to identify symptoms and changes typical for this disease in laboratory and instrumental examination methods.

3. Lecture abstracts:

Increasing the airiness of the lungs— is a pathological condition in which the number of vascular-interstitial structures in the lung tissue decreases against the background of excess air content. On an X-ray or percussion it manifests itself as: Hypertransparency of the lung fields. Box sound on percussion. Weakened vesicular or prolonged expiration on auscultation. The main causes are:

1. Obstructive pulmonary diseases:

COPD (pulmonary emphysema) Bronchial asthma (in the acute stage with air trap)

2. Acute hyperinflation:

In case of asthma attack, acute obstruction. In case of foreign body in bronchus with valve mechanism

3. Focal hyperairiness:

Valvular (tension) pneumothorax
Bullous emphysema
Bronchial atresia in newborns (congenital emphysema)
Diagnostic imaging:
On the radiograph:
Increased transparency of the lung field
Impoverishment of the pulmonary pattern
Displacement of mediastinal organs (in case of unilateral process)
Increased chest volume (horizontal ribs, flattening of the diaphragm dome)
On CT:
Extended air spaces (bullas, destruction zones)
Fine vascular structures
Air trap zones are possible

Respiratory failure is a pathological condition in which the lungs cannot provide normal gas exchange in the blood, which leads to a lack of oxygen and excess carbon dioxide. This condition can be acute or chronic and is associated with various diseases of the respiratory system and more.

Causes of respiratory failure:

Diseases of the lungs and respiratory tract:
Pneumonia, asthma, COPD, bronchial asthma, pulmonary fibrosis, pulmonary embolism.
Heart diseases:

Heart failure, congenital heart defects.
Diseases of the nervous system:
Amyotrophic lateral sclerosis, Graves' myasthenia, spinal cord lesions.
Tumors:
Tumors in the chest or lungs.
Other reasons:
Obesity, kyphoscoliosis, chest wall lesions, hemoglobinopathies, anemia, hypothyroidism.
Symptoms of respiratory failure:
Dyspnea: Feeling short of breath.
Blue lips and fingers: cyanosis, indicating a lack of oxygen in the blood.
Increased heart rate: Tachycardia.
Fatigue and weakness: Increased fatigue.
Fainting and dizziness: Especially in severe respiratory failure.
Sleep disorders: Insomnia.
Headaches: In severe respiratory failure.
Classification of respiratory failure:
Acute and chronic:
Acute respiratory failure develops suddenly and is life-threatening, while chronic respiratory failure develops gradually.
By severity:
Light, moderate, heavy.
By type of gas exchange disorder:
Hypoxemic (lack of oxygen), hypercapnic (excess carbon dioxide), mixed.
By mechanism of occurrence:
Obstructive (difficulty exhaling), restrictive (limited expansion of the lungs), diffuse (impaired gas exchange at the alveolar level).

Presence of fluid and cavities in the lungs

I. Fluid in the lungs: main forms
Transudate - serous fluid (↓ protein)
Reasons:
Heart failure (left ventricular)
Nephrotic syndrome
Cirrhosis
Exudate is an inflammatory fluid (↑ protein)
Reasons:
Pneumonia (parapneumonic pleurisy)
Tuberculosis
Malignant tumors
Systemic vasculitis
Blood in the pleural cavity (hemothorax)
Pus (pleural empyema)
Chylothorax - lymph in the pleura (impaired thoracic lymphatic duct)
Clinical signs of pleural effusion:

Method	Signs
Inspection	Asymmetry of the chest, delay in breathing
Percussion	Dullness of sound over the liquid zone
Auscultation	Weakened or absent breathing,bronchophony is weakened
X-ray	Horizontal liquid level, oblique lineDamoise

Ultrasound/CTAccurate volume, liquid structure
Difference from infiltration:
The infiltrate causes dullness and bronchial breathing.
The liquid causes dullness and weakened breathing.
II. Cavities in the lungs (caverns, bullae, abscesses, etc.)
1. Cavity - general definition:
A collection of air or fluid in lung tissue that occurs due to collapse, distension, or obstruction.
Acute respiratory failure (ARF) is a condition in which the body does not receive enough oxygen and cannot remove carbon dioxide due to the inability of the lungs to perform their main function - gas exchange. This is a critical condition that can lead to death without timely medical care.
Main features:
Dyspnea: Difficulty, shallow, or rapid breathing.
Cyanosis: Blue discoloration of the skin and mucous membranes.
Tachycardia: Rapid heartbeat.
Loss of consciousness: Impaired consciousness or coma.
Increased fatigue and anxiety: Hypoxemia can cause restlessness and anxiety.
Confusion: Hypoxemia may cause changes in consciousness.
Sweating: Increased sweating may occur.
Crackles: Moist rales that can be heard on auscultation of the chest.
Chronic respiratory failure (CRF)- is a pathological condition characterized by the inability of the respiratory organs to supply the human body with the required volume of oxygen, which leads to a decrease in the amount of O2 in arterial blood and an increase in CO2.
Causes of chronic respiratory failure
The occurrence of this pathology is associated with the presence of the patient:
Diseases that limit the depth of inspiration – obesity, kyphoscoliosis (curvature of the spine in the frontal and sagittal planes), fibrothorax (severe scarring and fusion of the pleural layers).
The consequences of a surgical operation that is performed to reduce the volume of the chest cavity and consists of resection of the ribs - thoracoplasty.
Diseases that involve damage to the neuromuscular system – amyotrophic lateral sclerosis, poliomyelitis, Duchenne disease.
Dysfunction of the diaphragm.
Spinal cord injury.
Congenital heart defect.
Anemia.
Hypothyroidism.
Bronchopulmonary diseases – tuberculosis, bronchial asthma, chronic bronchitis, obstructive sleep apnea syndrome, bronchiolitis, bronchiectasis, cystic fibrosis, pneumosclerosis, interstitial lung disease, emphysema.
Incomplete recovery after an episode of acute respiratory failure.
Diagnosis of respiratory failure:
Blood gas analysis: Determines the levels of oxygen and carbon dioxide in the blood.
ECG: To detect changes in cardiac activity.
Chest X-ray: To detect abnormalities in the lungs.
Pulse oximetry: Determines the oxygen saturation of the blood.
Spirometry: To assess the ventilation function of the lungs.

4. **Illustrative material:**presentation.
5. **Literature:**Akhmetov, K. Zh. Zh. Akhmetov. - Almaty: New book, 2022. - 266 p.
6. **Controlquestions:**

1. What is respiratory distress syndrome?
2.What are the main causes of respiratory failure?
3. What are the symptoms of respiratory failure?
4.What is heard during auscultation?
5.What percussion changes are typical for respiratory failure syndrome?
6.What breathing sounds are characteristic of respiratory failure?
7.What is the phenomenon of vocal fremitus and how does it change in respiratory failure?

7. Educational resources	
Electronic resources, including but not limited to: databases, animations, simulators, professional blogs, websites, other electronic reference materials (e.g.: video, audio, digests)	**"Propaedeutics of Internal Diseases"** Ivashkin, VTInternal diseases propedeutics [Electronic resource] :textbook. - Electron. text data (142MB). - M.: GEOTAR - Media, 2017. - email. wholesale disk Ishki aurular./Bimurzaev G.N., Zaripova G.K. , 2020 /https://aknurpress.kz/reader/web/2594 Ishki aurular pəninen klinikalyk tapsyrmalar zhinagy.Erzhanova G.A., Mukhanova A.K. , 2016/https://aknurpress.kz/reader/web/2370 Shki aurular propedeuticsynan zhaғdayattyk tapsyrmalar Orazova B.O., Marchenko T.V., 2016/https://aknurpress.kz/reader/web/2348 Akhmetov Kayyrgali Zhaleluly. Ishki aurular propaedeutics Panin clinic daristeri. Almaty: “Evero”, 2020. – 262 bet https://elib.kz/ru/search/read_book/22/ Internal non-infectious diseases with clinical radiological assessment KSU named after A. Baitursynov, 2011. – 94 p. http://rmebrk.kz/book/1024356
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	p.https://elib.kz/ru/search/read_book/682 Propaedeutics of Internal Medicine: Textbook. – 6th ed., III - volume revised and supplemented (Textbook for students of medical universities). – Almaty: Evero, 2020. – 208 pp. https://elib.kz/ru/search/read_book/684/ Nursultanova S.D., Bakirova R.E., Mamashalieva S.B., Bekov E.K., Madieva L.S. Zhurek tamyr zhuyesinin aurulary bar naukastardy tekseru ədisi zhene tekhnikasy. Oku-ədistemelik kural.- Almaty, “Evero” baspasy. - 2020.https://elib.kz/ru/search/read_book/705/ Ishki aғza aurularyn propaedeutics. Okulyk Aitmbet B.11 - Almaty “Evero” 2018, -568 bet. https://elib.kz/ru/search/read_book/3086/ Stryuk, Raisa Ivanovna.Internale diseases: in 3 parts: Part 1 textbook / R. I. Stryuk, I. V. Maev; [First. Moscow State Medical University named after I. M. Sechenov]. - Almaty: Evero, 2016. - URL: http:https://elib.kz/ru/search/read_book/2766/. Stryuk, Raisa Ivanovna.Internale diseases: in 3 parts: Part 2 textbook / R. I. Stryuk, I. V. Maev - Almaty: Evero, 2016. - URL:https://elib.kz/ru/search/read_book/2767/ Stryuk, Raisa Ivanovna.Internale diseases: in 3 parts: Part 3 textbook / R. I. Stryuk, I. V. Maev. - Almaty: Evero, 2016. – URL:https://elib.kz/ru/search/read_book/2768/ Pimenov, Yu. S. Internal Medicine. Volume 1: study guide / Yu. S. Pimenov, I. V. Roganova, L. N. Finko. - Moscow: REAVIZ, 2008. - 146 p. / Digital educational resource IPR SMART:https://www.iprbookshop.ru/10141.html Roganova, I. V. Internal Medicine. Volume 2: study guide / I. V. Roganova, V. F. Roganov, I. O. Prokhorenko. - Moscow: REAVIZ, 2008. - 132 p. / Digital educational resource IPR SMART:https://www.iprbookshop.ru/10142.html Clinical tasks in internal medicine: a tutorial / R. I. Saifutdinov, L. K. Kozlova, O. V. Bugrova [et al.]. - Orenburg: Orenburg State Medical Academy, 2012. - 152 p. - URL:https://www.iprbookshop.ru/21817.html
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