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Кафедра Внутрішньої медицини №3

Факультет VI по підготовці іноземних студентів

ЗАТВЕРДЖЕНО

на засіданні кафедри внутрішньої медицини №3

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Зав. кафедри _____ д.мед.н., професор Л.В. Журавльова

МЕТОДИЧНІ ВКАЗІВКИ

для студентів англійською мовою

з дисципліни «Внутрішня медицина (в тому числі з ендокринологією)

студенти 4 курсу I, II, III медичних факультетів, V та VI факультетів по підготовці
іноземних студентів

Бронхіальна астма

Харків 2016

Study subject "Bronchial Asthma."

1. Class Hours - 4

Topicality.

Bronchial asthma (BA) is one of the urgent problems of medicine, it greatly affects the quality of life of patients. Since the 1970s, the prevalence of asthma is increasing in many countries. Today, an estimated 300 million people are affected in the world. BA is responsible for every 250th death and 1% of all causes of disability. It is assumed that the economic costs of asthma surpass tuberculosis and HIV/AIDS combined.

Asthma attacks (or worsening episodic airway inflammation) is chronic. Many patients require daily use of drugs to control symptoms and prevent attacks.

Recent years marked significant progress in the diagnosis and treatment of asthma. Definition of asthma is a chronic inflammatory disease of the airways and as a result of the use of inhaled corticosteroids as anti-inflammatory drugs. However, despite these successes, the level of control over the disease can't be considered satisfactory (eg. Almost one in three patients with asthma suffers from sleep interruption at night (once a month) due to asthma symptoms). More than half the patients have limitations in physical activity; more than a third - miss classes at school or at work, up to 40% - are forced to seek emergency assistance due to exacerbation. The reasons for this situation are diverse, and the important role it plays is in the late diagnosis of asthma, the lack of awareness by the doctor in the pathogenesis of the disease and, therefore, wrong treatment strategy.

Diagnosis of asthma is widespread. Epidemiological studies among children and adults, especially the elderly, suggest that asthma in many cases is not diagnosed or replaced by other disease, and therefore properly treated. Patients suffer respiratory symptoms that are transient (short-lived) and intermittent in character leading to the patient seeking medical attention. Another important factor that leads to inadequate diagnosing asthma is the non-specific nature of symptoms. Often diagnosing asthma as a form of bronchitis, leads to no effective treatment due to prescribing courses of antibiotics and drugs against cough. Mentioned thesis says: "All that is accompanied by whistling and wheezings not asthma, but asthma is the cause of whistling, wheezing and related symptoms" so it is more correct to say: "Everything accompanied by whistling and wheezing is asthma until proven otherwise ". COPD, which include chronic obstructive bronchitis (COB) and emphysema (EL), make up a large medical and social problem in the world. These diseases occupy one of leading places in terms of morbidity and mortality. Specialists of the Institute of Pulmonology Sciences of Ukraine believe that about 7% of the population suffers from Chronic Obstructive Bronchitis (COB). It should be noted that about 60% of patients with Chronic Obstructive Bronchitis (COB) are labeled group 2 with an average life expectancy of 5.5 years after the discovery of the disease.

Learning Objectives:

- Teach students to recognize the major symptoms and syndromes of asthma;
- Acquaint students with physical methods of research in asthma;
- To introduce students to research methods that are used to diagnose asthma; indications and contraindications for their conduct; methods of their implementation; Diagnostic value of each of them;
- Teach students to interpret the results of studies;
- Teach students to recognize and diagnose complications of asthma;
- Teach students to administer treatment for asthma.

What the student should know?

- Frequency of asthma;
- Etiological factors of asthma;
- Pathogenesis of asthma;
- Main clinical symptoms in asthma;
- General and anxiety symptoms in asthma;
- Physical symptoms of asthma;
- Methods of physical examination of patients with asthma;
- Diagnosis of asthma;
- Diagnostic possibilities in asthma peak flow meter, indications, contraindications;
- Radiological methods of diagnosis of asthma;
- Complications of asthma (asthmatic status, coma);
- Management of patients with status asthmaticus;
- Treatment of asthma (lifestyle changes, nutrition, drug therapy).

What the student should be able to?

- Remove the main clinical and physical symptoms of asthma;

- Interpret of the results of biochemical and immunological studies;
- Interpret picfluometry data;
- Interpret data spirometry, spirometer, and research related flow/volume.
- Interpret data radiological diagnostic methods in asthma;
- Prescribe treatment for patients with asthma.

The list of practical skills that students must master:

- External review of patient
- Examination of the chest;
- Percussion;
- Auscultation of the lungs.

CONTENTS THEME:

Definition. Bronchial asthma (BA) - a chronic inflammatory disease of the airways involving eosinophils, lymphocytes (T helper cells), macrophages, basophils, mast cells, neutrophils, which is characterized by generalized bronchial obstruction of different severity, which may be partially or fully reversible (spontaneously or under bronchodilator effect), and the phenomenon of bronchial hyperreactivity. (Global strategy for the prevention and treatment of asthma, GINA, 2002, 2008).

Broncho-obstructive syndrome in asthma is caused by a spasm of bronchial smooth muscle, edema of bronchial mucosa. Hyperreactivity can be specific and nonspecific; the pathophysiology of asthma signs which underlines airway instability.

Etiology and pathogenesis. Chronic inflammation can be induced through contact with an allergen, pollutants, industrial factor, and acute viral infection. The inflammatory process leads to four forms of bronchial obstruction, acute spasm of smooth muscles of the respiratory tract, subacute swelling of the mucous membrane of the respiratory tract, chronic formation of viscous bronchial secretions and irreversible sclerotic process in the airways. BA may be of non-allergic origin, such as a brain injury, resulting in endocrine disorders. Infectious-allergic asthma develops against various infectious respiratory disease (pneumonia, bronchitis, tonsillitis, nasopharyngitis), where bacteria are antigens. In most cases, they are opportunistic and saprophytic flora (*S. aureus*, *E. coli*, *Klebsiella* spp.). This form of asthma is the most common and is based on aggregated statistics from 67 to 98%. Atopic asthma is linked with genetic predisposition. Atopic asthma occurs due to the increased production of IgE in response to environmental allergens. The clinical and pathogenetic variants are: autoimmune, nervous, mental, dyshormonal, cholinergic (Vagotonic associated with adrenergic imbalance, with

changes in bronchial reactivity), asthmatic attack during physical effort, and aspirin asthma. Various forms can be combined with each other.

The basis of immune mechanism of asthma development. The issue of non-immune form of asthma is controversial. According to the majority researcher's opinions, non-specific factors that provoke an attack of asthma (physical and psycho-emotional stress, meteorological changes, environmental problems, and medications) are so-called triggers. These factors are always secondary, because their action is always preceded by sensitization of the organism and the development of allergies.

Causative factors of asthma are divided into "inductors" causing allergic inflammation and associated constriction and airway hyper-responsiveness, and "triggers" that provoke bronchospasm and aggravate inflammation.

Inducers of asthma most often are:

- Household allergens, including leading role belongs house dust mites (dermatophagoides pteronyssimus, farina, microceras, Euroglyphus mainei), whereby allergens are as the body of the tick and its secretion and excretion;
- Allergens of animal origin: wool, feathers, droppings, saliva of animals and insects, Daphnia and other;
- Fungal allergens, mold and yeast fungi (Alternaria, Aspergillus, Mucor, Candida, Penicillium, Cladosporium);
- Pollens allergens three main plants: trees, shrubs, grasses and weeds;
- Food allergens;
- Drugs: antibiotics, particularly penicillin, vitamins, aspirin and other nonsteroidal anti-inflammatory drugs;
- Viruses and vaccines, particularly DTP;
- Xenobiotics, chromium, nickel, manganese, formaldehyde.

Triggers are factors that cause allergic inflammation which aggravates asthma, the development of asthma attacks are divided into specific (allergenic) and non-specific (non-allergenic) actions.

specific triggers act by repeated contact with an allergen sensitized body.

Specific triggers sensitize the body when repeated contact with the allergen occurs. This allergens may be antigenic properties of the virus.

By nonspecific triggers include:

- Respiratory viruses that damage the ciliated epithelium of the mucous membrane of the respiratory tract, which increases its permeability and sensitivity to allergens irritate subcutaneous receptor layer of the bronchi and promotes bronchial reactivity;
- Parasitic infection (toxocarosis), Mycoplasma, Legionella, Chlamydia;

- Air pollution by carbon monoxide, sulfur dioxide and nitrogen, metals, dust, products of incomplete combustion of gasoline - these substances damage the bronchial epithelial cells, promote the implementation of bronchial hypersensitivity;
- Pollutants areas: products of human activity (ammonia, nitrous oxide and carbon, hydrogen sulfide, etc.), chemicals and solid particles released during the use of gas stoves, furnaces, chemical substances released by modern building materials, air conditioning systems;
- Tobacco smoke, which contains more than 30 kinds of substances that have a direct toxic and irritating effect on the mucous membrane of the respiratory tract, reducing the effectiveness of non-specific and specific protection systems, accompanied by excessive secretion and stagnation of mucus, reduced bactericidal properties and activity of lysozyme, reflex bronchospasm and violation of the drainage function of bronchi;
- Change in meteorological, low temperature, high humidity, drop or increase in atmospheric pressure;
- Physical activity, change in temperature, moisture, osmolarity of airway secretions in conditions of hyperventilation can lead to increased bronchial hyperreactivity and bronchospasm development ("asthma physical effort");
- Circadian rhythms of night maximum histamine formation, increased bronchial sensitivity to histamine and acetylcholine, the tone of the parasympathetic nervous system and decrease cortisol concentrations in blood, body temperature, ventilation performance in connection with a decrease in inspiratory muscle activity of the diaphragm during REM sleep ("nocturnal asthma");
- Gastroesophageal reflux;
- Dishormonal processes - menopause, uterine fibroids, hyperthyroidism affect the occurrence of attacks and asthma;
- Psycho-emotional factors that may provoke bronchospasm reflex.

The inflammation of the bronchial mucosa occurs at the early stages of asthma. Activation of T-helper cells leads to the production of cytokines that characterize as "allergic" inflammation. There is also a migration of eosinophils into the bronchial tree, their activation with subsequent release of vasoactive substances that damage the bronchial mucosa tissue. Neutrophil's inflammatory nature predominates in acute severe asthma attacks associated with sudden death. In severe forms of asthma there is increase in the number of macrophages. Mast cells play an important role in the immediate response to allergen exposure due to the production of proinflammatory cytokines. The consequence of chronic inflammation in asthma is remodeling of lung tissue, destruction of epithelial cells by desquamation thickening basement membrane disruption basic substance, hyperplasia and hypertrophy of smooth muscles of the bronchi. There is a relationship between the concentration of serum immunoglobulin E (IgE), the clinical signs of bronchial asthma and hyperactivity.

Hyperactivity—is a basic universal sign in the Pathophysiology of asthma, which causes instability of airways influenced by usual irritating environmental factors and manifests itself clinically broncho-obstructive syndrome.

In the pathogenesis of asthma are three stages: 1) immune - under various allergens produce antibodies or lymphocytes sensitization occurs; 2) patochemical - with repeated action of allergens out of mast cells mediators; 3) pathophysiological - development of bronchial obstruction syndrome.

An allergic reaction is immediate and delayed type. In the immediate type reactions the leading role reagin (IgE) reacts with the antigen. Thus the membrane surface of mast cells bronchial mucosa formed antigen-antibody complexes. This is accompanied by aggregation of membrane IgE-receptors and trigger is activated mast cells. In patochemicalstage due to the activation of antigen-antibody reaction in the membranes of mast cells released active substances - histamine, serotonin, bradykinin, leukotrienes, acetylcholine, prostaglandin F_{2α}. Mediators cause vasodilatation, increased capillary permeability, hypersecretion of glands and smooth muscle spasm, bronchial mucosa infiltration of eosinophils and other inflammatory cells.

The development of an asthma attack while taking aspirin resembles an allergic reaction, but it is based on immune mechanisms. Aspirin inhibits cyclooxygenase, which leads to the metabolism of arachidonic acid. Also, aspirin inhibits the synthesis of prostaglandin E, which has a bronchodilator effect and enhances the action of prostaglandin F_{2α} (Bronchoconstrictor), histamine and leukotrienes.

Hyperreactivity of large and small bronchi is associated with chronic inflammation, coordinated by T-helper type 2 (Th₂). Th₂ secrete interleukin (IL) 4 and 5. IL-4 is the primary cytokine that switches to B lymphocytes IgE, synthesis of IL-5 selectively activates eosinophils. Activation of eosinophils also participate IL-3, trombotsytoaktivefactor. IL-1 is produced by macrophages and promotes Th₁ that begin to produce IL-2, which affects lymphocyte proliferation. IL-10 produced by Th₂ and inhibits the function of Th₁.

Classification of asthma.

Classification by etiology of asthma, especially in terms of the definition of exogenous factors sensitizing (allergic, no allergic, mixed, unspecified BA) low effective both in terms of differentiating inflammation in the airways, clinical symptoms and further therapeutic tactics.

Classification of asthma based on severity according to the analysis of complex clinical and functional signs of bronchial obstruction. Evaluate the frequency, severity and duration of attacks expiratory dyspnea, the patient's condition between the attacks, the degree of variability and reversibility of functional disorders of bronchial obstruction, the response to treatment. Estimates of changes functional parameters to determine the severity of the disease is carried out in the absence of episodes of expiratory dyspnea. According to this classification, the patient's condition is determined by the severity of asthma. Intermittent (episodic) course, persistent (permanent) course are: easy, moderate and hard.

Intermittent asthma.

Clinical symptoms before treatment:

- Symptoms (episodes of coughing, wheezing, shortness of breath) short-term, there are at least 1 time per week for at least 3 months
- Short-term aggravation
- Night symptoms occur no more than 2 times a month

The absence of symptoms, normal values of between exacerbations. FEV1 or Volume of exhale > 80% of the relevant

- Daily fluctuations Volume of exhale or FEV1 < 20%.

Easy persistent asthma.

Clinical symptoms before treatment:

- Symptoms often, at least - once day a week, but less than 1 time per day for more than 3 months
- Exacerbation of symptoms can disrupt sleep and activity;
- The presence of chronic symptoms that require symptomatic treatment almost daily;
- Night asthma symptoms occurring more than 2 times a month;
- FEV1 or Volume of exhale > 80% of the relevant;
- Daily fluctuations Volume of exhale or FEV1 - 20-30%.

Middle severity of persistent asthma.

Clinical symptoms before treatment:

- Symptoms occur daily
- Worsening lead to disruption of activity and sleep
- Night asthma symptoms occur more than 1 time per week
- The need for daily intake β 2-agonists short action
- FEV1 or Volume of exhale within 60-80% of the relevant
- Daily fluctuations Volume of exhale or FEV1 > 30%.

Severe persistent asthma.

Clinical symptoms before treatment:

There is presence of largely variable long symptoms, frequent nocturnal symptoms, activity limitation, and severe exacerbation. Despite the treatment, which is carried out, the absence of proper control of the disease

- The constant presence of long daytime symptoms;
- Frequent night symptoms;
- Frequent, severe exacerbation;
- Limit physical activity caused by asthma;
- FEV1 or Volume of exhale < 60% of the relevant;
- Daily fluctuations Volume of exhale or FEV1 > 30%;
- Achieving asthma control may not be possible.

Classification of asthma by severity is particularly important when deciding keeping disease at initial evaluation of the patient.

International Classification of Diseases 10th revision

J45 Asthma

Excludes: acute severe asthma (J46)

chronic asthmatic (obstructive) bronchitis (J44.-)

chronic obstructive asthma (J44.-)

eosinophilic asthma (J82)

Lung disease, caused by external agents (J60-J70)

Asthmatic condition (J46)

J45.0 Asthma prevalence of allergic component

Non-allergic asthma J45.1

J45.8 Mixed asthma

J45.9 Asthma, unspecified

J46 Asthmatic state (status asthmaticus)

Clinical manifestations of asthma.

Symptoms of asthma:

- Episodic breathlessness with difficulty in exhaling;
- Cough more at night and during exercise;

- Occasional whistling wheezing in the lungs;
- Stiffness of the chest.

Symptoms are mostly aggravated at night and in the early morning hours, and awaken the patient. Manifestations of asthma symptoms also occur or worsen in:

- Exertion;
- Viral infection;
- Exposure to allergens;
- Smoking;
- Outdoor temperature difference;
- Strong emotions (crying, laughing);
- Of chemical sprays;
- Taking certain medications (non-steroidal anti-inflammatory drugs, β -blockers). The diagnosis of asthma is usually based on the presence of characteristic symptoms. A characteristic is the daily and seasonal variability of symptoms.

In the development of asthma attack are three periods: the period precursors (prodromal), period of breathlessness, and the period of reverse development.

The period of precursors is marked by a large variety of symptoms. In patients with asthma, allergic component immediately preceding the attack worsens vasomotor rhinitis, sneezing, nasal congestion, possible itching (area of the chin, neck and back), and excessive serous discharge from the nose, scratchy throat or allergic phenomena conjunctivitis (itchy eyes and watery eyes).

In patients with severe bronchospasm vagal component nausea, indigestion, headache, fatigue. Usually attacks in these patients develop night.

Patients with asthma of non-allergic origin, which in interictal period a lot of "lung" complaints (cough, shortness of breath and so on). At the beginning of a pronounced attack there is coughing which then turns into nonproductive coughing paroxysms where there is deterioration or complete cessation of discharge sputum (an informative sign), increased shortness of breath. Generally, the mood deteriorates (depression and anxiety).

Period asthma are characterized by shortness of breath, which is mostly in expiratory asthma character - exhalation phase duration can be 3-4 times greater than the duration of inhalation, exhalation rate is less than the speed of inspiration. Breath is short, strong and deep, exhalation - slow, spasmodic, accompanied by wheezing with whistling. Sometimes accompanied with complicated inhalation and exhalation. Typical bradypnoe (10-12 breaths per minute), though possible and rapid breathing.

Period reverse development is very variable in its manifestations. Coughing up phlegm is often a harbinger end attack. Sputum usually scanty, viscous, foamy, white contains dense clumps and

threads ("pearl" sputum) - casts sealed bronchi. When asthma with allergic component in the patient's condition during after attack is normalized - satisfied patient wants to drink is often mild drowsiness. In patients with asthma non-allergic for several hours kept difficult breath, weakness, drowsiness, depression.

Anamnestic criteria:

- Frequency of occurrence of asthma symptoms, often seasonal
- Feeling chest pressure
- The appearance of symptoms while presence of allergens, against respiratory infection after physical or psycho-emotional stress and symptoms disappear after cessation of contacts with the cause and significant factor;
- Accompanying manifestations of atopy;
- Burdened by a family history of atopy;

Physical examination.

During the attack patients often take a forced sitting or standing position withincline of body forward, leaning on hand with a raised shoulder and summary. Sometimes taking Bozeman position. Severe emotional reaction - the patient concerned, suffering facial expression, scared, can barely speak.

The face of the patient during an attack puffy, covered with cold sweat, wings swellsof nose during inhalation, neck veins dilated. Thorax "frozen" in position of maximum inspiration, hard breaths lower parts of the chest, intercostal spaces, supraclavicular fossa drawn inside. Severe stress all groups of auxiliary respiratory muscles of the shoulder girdle, abdominal press, especially intercostal, sternum-clavicular-mastoid.

The occurrence of subfebrile rises of body temperature is possible.

Physicaldetermined emfizematoz signs of acute swelling of the lungs and bronchial obstruction. Percussion sound of the tympanic shade, the lower boundary of the lungs omitted mobility of the lower edge of the lungs is reduced dramatically decreases relative cardiac dullness. Breathing can be either hard or relaxed, and lengthened exhalation. Auscultation reveals lots of dry whistling and wheezing with different shades, mostly high tone, especially on expiration.

Pulse accelerated andrespiratory sinus arrhythmia. Often there is emphasis II tone of the pulmonary artery because of severe pulmonary hypertension. Blood pressure is reduced by 20-30 mmHg in elderly - often are increase . With prolonged fit of severe symptoms may appear right ventricular failure - enlarged liver, abdominal distension, flatulence.

Additional methods.

1. Hemogramm (Eosinophilia, lymphocytosis, and a tendency to leukopenia. Prolonged severe course may develop compensatory increase of erythrocyte and hemoglobin).

2. Analysis of sputum (eosinophilia bronchial secretions, Curschmann's spirals, Charcot-Leyden crystals).
3. X-ray study (as determined by increased transparency of the lung fields, strengthening of pulmonary picture, the expansion of the roots of the lungs. The typical low standing, low mobility dome of diaphragm. The ribs are horizontally extended intercostal spaces).
4. Electrocardiography (increase in T wave in all leads, often increasing the P wave in leads II and III. In severe hypoxia infarction observed depression ST segment in I, aVL, V 4-6 leads).
5. Allergic study (Allergic history - the presence of allergic rhinitis patients, atopic dermatitis or asthma or atopic disease in his family, Leather positive tests with allergens, elevated levels of total and specific IgE).

Allergy diagnostic tests.

I. Clinical diagnostic methods allergy in vivo. Intradermal allergy tests are carried out by intradermal administration of allergen during remission.

A. Direct allergological skin tests.

The principle of the method is that, in patients with atopic diseases sensybilized shock not only the body but also other organs and tissues. The introduction of the allergen intradermally accompanied early or late manifestations of allergy. According to the study 24-36 hours antihistamin stop receiving the drugs. Considered positive reaction if the injection occurs "allergen wheal" or erythema severity of the reaction is measured by a four-system. For the selection of allergens used for testing a history, in the absence of such conduct testing with a wide range of standard allergens. Often allergens specially prepared for testing if there is a medical history background («individual allergen»). Take into account there are atopic reactions to certain allergens. For a course specific hyposensitivity and selection of the initial dose of allergen skin tests ask a series of different dilutions of one allergen, which gave a positive reaction in the initial diagnostic test - titration of the skin. The sensitivity of skin tests modifications increases in the following order: skaryfikation, injections, intradermal. Start with research skaryfikation tests.

B. Passive (indirect) allergological skin test.

Test Prausnitsa-Kyustnera is the introduction of healthy person serum allergy patient, which contains specific IgE to this allergen. If the person being tested for the allergy has antibodies for the antigen this will cause local reaction in the non-allergic person when the antibodies mix with the antigen. This demonstrates type I hypersensitivity reaction and the allergic reaction to the injected antigen is confirmed for the person being tested. A positive PK test usually appears as a wheal and flare. Research is safe for the patient, but is a threat to health - the transfer of the Australian antigen, HIV, used limited.\

C. Provocative allergological test.

Artificial reproduction of symptoms by introducing a limited dose of allergen. Provocative tests are used in cases where allergic history data does not match the results of allergy skin tests. These tests are the most specific for the diagnosis of diseases of allergic origin, their chance due to the fact that allergens are in direct contact with the shock body, causing a reaction antigen - antibody and the development of symptoms of allergic disease. There provocative tests with different routes of administration of allergens - inhalation, conjunctival, nasal, oral, heat, cold, with physical activity, and exposure.

D. Provocative inhalation test.

They are used for the diagnosis of asthma is the most reliable method of diagnosis of specific asthma. They are used to assess bronchial sensitivity to the allergen (bronchial allergen testing) effectiveness hyposensitivity specific and non-specific treatment of asthma. Inhalation tests are conducted only in cases of conflict in history and skin-prick allergy diagnostic tests.

While carrying out the following study closely follow the test methods as they may cause severe asthma attacks. To evaluate the results of tests using FEV1 before and after inhalation under allergen test. The reaction was considered positive with a decrease in FEV1 greater than 20% from baseline. To characterize the reactivity of bronchopulmonary system build curves "dose-response" with a gradual increase in the concentration of allergen respirable air.

E. Elimination test.

Diagnosing allergies when a patient is contacted with a possible allergen. Elimination tests carried out in the period of exacerbation. A positive test is considered in case of reduction or complete elimination of symptoms after cessation of exposure to the allergen. Allergy patients are hospitalized or sent to sanatorium, the avoidance of some food or domestic animal (allergens).

With food allergies, fasting is followed by elimination diet, as such as - dairy-free from meat, vegetables and others. Improving the patient, decrease asthma attacks indicate that the product is excluded and is an allergen. For greater probability study after conducting provocative oral test with a possible allergen.

II. Laboratory methods for diagnosis of allergies (in vitro). As provocative tests carried out even in the phase remission diseases and may be dangerous to the patient, often causing marked general reaction up to full-scale asthma attack or status asthmaticus. Laboratory tests are safe, can be performed in acute diseases, during any time, regardless of circulating allergen in the environment, against specific desensitization.

A. Tests that find raising specific immunoglobulin E (reanimation).

Radioallergosorbent test (RAST). The RAST is a radioimmunoassay test to detect specific IgE antibodies to suspected or known allergens for the purpose of guiding a diagnosis about allergy. IgE is the antibody associated with Type I allergic response: for example, if a person exhibits a high level of IgE directed against pollen, the test may indicate the person is allergic to pollen (or pollen-like) proteins. A person who has outgrown an allergy may still have a positive IgE

exposure.

The suspected allergen is bound to an insoluble material and the patient's serum is added. If the serum contains antibodies to the allergen, those antibodies will bind to the allergen. Radiolabeled anti-human IgE antibody is added where it binds to those IgE antibodies already bound to the insoluble material. The unbound anti-human IgE antibodies are washed away. The amount of radioactivity is proportional to the serum IgE for the allergen..Specificity 97%.

Radioallergosorbent test (growth). Apply for a specific diagnosis of bronchial asthma, with defined levels of antibodies to IgE in healthy content antibodies in serum IgE ranges from 1 to 200 ng / ml. Low levels of antibodies to IgE virtually eliminates the formation of atopic disease, high - indicates a high probability of atopic processes in the patient.

Immunoferment investigation. The initial stages of the research is similar to RAST. Allergosorbent system (allergen fixed on the insoluble sorbent) with serum incubation be patient. It forms antigen-antibody complex (allergosorbent - specific Ig E). Components that are not contacted are removed by washing. By the complex formed by joining anti-immunoglobulin E. Indicates complex allergosorbent - specific Ig E - E anti-immunoglobulin by using enzymes (peroksydaze, alkaline phosphatase).

B. Tests that detect sensibility of cells.

Reaction inhibition of migration of leukocytes (RHML).Lymphocytes of patient have sensitivity to a particular allergen, the allergen incubated with this lost capacity for migration. The results coincide with the method according to skin tests.

The reaction of blast transformation lymphocytes (RBTL). Incubation of patient's lymphocytes with the allergen to which the patient sensitized to, is transformed to blast lymphocytes shapes after 4-6 nights - increasing the volume of the nucleus, cytoplasm and nucleoli amount due stimulation of RNA synthesis is basophilic cytoplasm. The sensitivity of the method compared with the skin test 60%.

Test Shelley (degranulation of basophils). Basophilic granulocytes patient is mixed with an allergen on the objective lenses. A positive reaction (patient sensitive to this allergen) in 20 minutes the shape basophils appear pseudopodium, vacuoles in the cytoplasm, changing accommodation granules.

Electrophoretic mobility macrophages test. Sensitized lymphocytes in peripheral blood of patients incubated allergen that caused sensitization within 24 hours. It highlights bioactive substances which reduce the charge of indicator cells (macrophages), causing their electrophoretic mobility decreases.

Test of neutrophil damage index (PUN). The test is based on the accounting gain neutrophils activity due to the impact of complex allergen - specific IgE. This test uses standard allergens.

Test histamine release from mast cells and basophils. Isolation of the whole blood or leukocytes and then adding a potential allergen. If sensitization to this allergen occurs, basophils of mast cells and histamine are released, defined in overprecipitate liquid. Consider positive reaction in which histamine level increased by 50%.

Test adrenaline stimulating glycogenesis lymphocytes. The presence of the allergen sensitizes of lymphocytes, of which the expression stimulated by adrenaline glycogenesis 5-10 times lower than in control conditions. Test is highly informative for the diagnosis of drug allergy.

Now only the integrated use of clinical and laboratory methods allows a sufficiently accurate and reliable diagnosis of allergic diseases.

6. Studies of lungs function (LF) Research conducted to determine the severity of bronchial obstruction, its reversibility, variability, and confirm the diagnosis of asthma. Criteria for abuse LF

- Signs of bronchial obstruction - value volume peak expiratory flow rate (Volume of exhale) and forced expiratory volume in the first second (FEV1 <80% due;
- Severe bronchial obstruction reversibility - raising Volume of exhale and FEV1 > 12% (or > 200 mL) the results of pharmacological tests with β 2-agonist short action;
- Volume of exhale daily variability and FEV1 > 20%

7. Determination Hyperactivity bronchi. Conducted in patients with clinical symptoms that are characteristic of asthma, but the absence of specific violations LF. Hyperactivity measured by bronchial provocation test result from:

- Histamine, methacholine;
- Physical activity.

These tests are sensitive in the diagnosis of asthma, but have limited specificity.

Complications of asthma. A. respiratory tract infection - frequent complication of asthma. They can occur both during exacerbation and remission while and often provoke attacks of asthma. Dry wheezing, audible at a distance, while acute respiratory disease may be the first manifestation of asthma in children. BA should exclude all children with frequent bronchitis and acute respiratory diseases.

1. Acute respiratory infections often cause asthma attacks. The most common infections caused by respiratory syncytial virus, parainfluenza virus, and influenza and rino-Adenovirus. It is assumed that these viruses are directly on the bronchi, enhancing their reactivity. Perhaps the occurrence of asthma attacks during acute respiratory disease caused by Ig specific for the virus or decreased sensitivity of β -adrenergic receptors and release of inflammatory mediators.
 2. Bacterial infections often provoke attacks of asthma. The exception is chronic sinusitis and mycoplasma infection.
 3. Pneumonia usually develops again, after long or frequent asthma attacks when the bronchi accumulate a large amount of mucus. At the age of 5 years, more often viral, 5-30 years - mycoplasma, after 30 years - and other bacterial pneumococcal pneumonia.
- B. atelectasis - partial, segmental and subsegmental - may occur when both exacerbation and remission. Usually their appearance is associated with occlusion of the bronchial mucous plugs. For typical atelectasis increased cough, constant wheezing, shortness of breath, fever, weakened vesicular breathing and blunting percussion sound in the area of

atelectasis. Often there's atelectasis middle lobe of right lung. Often they are diagnosed. If you suspect atelectasis shows a chest X-ray. Atelectasis are characteristic of young children often recur, while certainly collapses same area of the lung.

B. Pneumothorax and pneumomediastinum. 1. pneumothorax - rare complication of asthma. During relapse of pneumothorax excluding brush, partial congenital emphysema and other lung diseases. Pneumothorax may occur when a strong cough and during mechanical ventilation. This problem should be suspected in the sudden appearance of pain on the affected side, aggravated by inhalation and occurrence of dyspnea, tachypnea accompanied, sometimes - cough. The diagnosis is confirmed by chest X-ray. With a small pneumothorax (less than 25% of the pleural cavity) in the absence of severe breathlessness and pain appear bed rest and observation. The air in the pleural cavity dissolves own. In other cases, required thoracotomy.

2. Pneumomediastinum and subcutaneous emphysema occur more frequently than pneumothorax. Patients usually do not complain because these complications are randomly observed during chest X-ray, examination and palpation of the neck and trunk. Sometimes pneumomediastinum appears chest pain, rarely - dyspnea, tachypnea, tachycardia, cyanosis and hypotension arterial upper half of the body. A characteristic feature pneumomediastinumoma- Hamman symptom (crepitation sound during auscultation of the heart). Pneumomediastinum and subcutaneous emphysema usually occur during heavy coughing and ventilation. Treatment in most cases is not necessary, in severe cases, draining the mediastinum is required.

G. Bronchiectasis - rare complication of asthma. They usually occur when a combination of chronic bronchitis asthma, prolonged atelectasis or allergic bronchopulmonary aspergillosis. If bronchiectasis observed prolonged cough, purulent sputum, coughing up blood, a symptom of drumsticks. It should be noted that in uncomplicated asthma the last sign is missing. Sometimes the diagnosis is possible based on chest X-ray, but in most cases it requires X-ray or CT scan. In rare cases, conduct Bronchography.

D. Allergic bronchopulmonary aspergillosis. Pathogen – *Aspergillus fumigatus*. In the pathogenesis of the disease play a role in allergic reactions caused by the agent. Observed mainly in adult patients with asthma.

E. Cardiovascular complications of asthma often occur arrhythmias - ventricular beats from liquid to fibrillation of ventricles. Arrhythmias more common in patients with cardiovascular disease. The incidence of arrhythmias and hypoxemia increases in abuse of β -agonists. During an attack of asthma may overload right heart. Right heart failure develops very rare - only in case of prolonged severe hypoxemia and volume overload. During an attack of asthma often observed pulmonary hypertension, pulmonary heart but occurs only when asthma combined with COPD. To reduce hypoxemia prescribed oxygen inhalation. Limit the use of β -agonists (such as inhaled and systemic) and theophylline. In severe right heart failure and arrhythmias Cardiac glycosides (if not caused sinus arrhythmia drugs) and other antiarrhythmic means. It must take into account whether they cause bronchospasm.

Jean status asthmaticus and respiratory failure. Asthmatic status - the most common and dangerous complications of asthma requires emergency intensive care. Mortality in status asthmaticus in a specialized compartment is 5%. Asthmatic status - intense, prolonged attack of asthma resistant to conventional therapies, accompanied by blockade of β -blockers, insensitivity to sympatholytic, forming a syndrome of total bronchial

obstruction, pulmonary hypertension and acute pulmonary heart disease, significant violation of blood gas composition (hypoxia and hypercapnia) with hypoxia possible transformation into a coma. There are two forms of asthma status - anaphylactic and metabolic.

Differential diagnosis. There are many diseases that are accompanied by bronchial obstruction.

Chronic obstructive pulmonary disease - shortness of breath and persistent difficult as bronchial obstruction is irreversible. Under the influence of treatment and severity obstruction dyspnea reduced, but not eliminated completely. There is no spontaneous and complete remission. Severity obstruction and shortness of breath may be increased under the influence of exercise or other reasons, but not as take place paroxysms, but gradually. Cough and sputum at COB also relatively permanent.

Exogenous allergic alveoli manifested episodes of breathlessness dry cough, fever and malaise through 2-12 hours after inhaling the corresponding antigen. Auscultation – sided crepitation more in basal departments. Radiological – dissemination pulmonary nodular or mixed character, then "Screen" light. Functional studies - for violations of restrictive type of ventilation without evidence obstruction. When intradermal administration of allergen - delayed hypersensitivity.

Hypotonic tracheobronchial dyskinesia (expiratory stenosis of the trachea and the large bronchi) appears bouts of breathlessness difficult expiration. Possible dizziness due to asphyxia - bouts of coughing and breathlessness. The attacks are not eliminated by bronchodilators, provoked by exercise, laughter, a viral infection.

Hypotonic tracheobronchial dyskinesia is the result of changes in membranous part of the trachea and the large bronchi - thinning, stretching, loss of elastic properties and therefore sag (prolapse) into lumen airway on exhalation intra thoracic with increasing pressure.

The reason may be dyskinesia frequent acute viral tracheobronchitis, mycoplasma infection. The differential diagnosis based on the absence of wheezing in the lungs, ineffectiveness bronchodilators, data and bronchoscopy spirogram- stan-step spirogram curve in expiratory phase during normal breathing break from chipping forced expiratory curve.

Diseases of the trachea and larynx - narrowing, fracture, tumors, foreign bodies.

Compression of the trachea mediastinal tumor, aneurysm, abscesses, tumors of the thyroid gland. Diseases of the larynx - laryngospasm, vocal paralysis, inflammation or swelling of the epiglottis deviation, tumor, polyps, and compressed scar stenosis, laryngeal infiltration, fat obesity syndrome, sleep apnea, and muscle lesions in the larynx neuromuscular diseases. Possible development of attacks of breathlessness, cough, dry appearance crepitation. Characteristics tridor - increased airway resistance on inspiration. Inefficient bronchospasmolytics and glucocorticoids, no signs hyperreactivity of bronchi. Acute left ventricular failure manifested by signs and symptoms of cardiac asthma. embolism pulmonary artery may be accompanied by wheezing and asthma attacks. The differential diagnosis based on hemoptysis, pain in the chest when breathing, tachycardia, hypotension, no distant wheezes, signs of acute right heart failure.

Hysteria in women may be associated with seizures difficulty breathing - the passage of air through the glottis partially covered accompanied by wheezing on exhalation.

Auscultation of the lungs no wheezing, breathing with difficulty.

Syndrome of hyperventilation manifested by hyperventilation with a sense of

dissatisfaction breath, short of breath, dull pain in the heart. Auscultation difficult breathing, no wheezing.

Diseases of the digestive system of gastroesophageal reflux accompanied by bouts of heartburn, dysphagia and breathlessness. Helminths invasion- ascariasis, ankilostomoz, schistosomiasis, filyarioz may be accompanied by bouts of bronchial obstruction, lung and eosinophil infiltration in peripheral blood.

Carcinoid syndrome in tumor cells with enterochromaffin that form serotonin, bradykinin, histamine, prostaglandin manifested serotonin crises - bronchospasm, hypotension, pain and rumbling in the stomach, watery stool, blood flow to the face, the upper half of the body. The blood serotonin high content in urine – metabolites serotonin 5 hydroxyindol acid.

In order to determine the possible, the best treatment results, answering the question how the patient should respond to prescribed therapy, introduced the concept of asthma control.

Scheme of BA evaluation

<i>Characteristics</i>	Controlled course	Partial control	Uncontrolled course
Daytime symptoms	None(<2 / week)	>(<2 / week)	>3
Обмеження активності	None	Any - when	Signs controls available in any week
Night symptoms / awakening over the BA	None	Any - when	
The use of bronchodilators as needed to relieve symptoms	None(<2 / week)	>(<2 / week)	
LUNGS FUNCTION (NEPs vyd.abo FEV 1)	Normal rates	<80% of the total or personal best (if known)	
Aggravation	None	> 1 /рік	Будь - коли

The level of control and treatment capacity is determining the appropriate choice.

Tactics for further treatment.

Treatment of asthma. Drug therapy for asthma patients spend using different routes of administration of drugs - inhaled, oral and parenteral. The greatest advantage is inhalation, providing a strong local effect of drugs in the lungs without causing their unwanted systemic effects, makes it possible to accelerate the positive effect of treatment due to lower doses of medication.

Controlling medicines

Used daily basis, the long-term basis, to achieve and maintain control of persistent asthma. Include inhaled corticosteroids, systemic corticosteroids, cromones, leukotrienes modifiers, long-acting bronchodilators (inhaled β_2 -agonists, long-acting oral β_2 -agonists, long-acting, long-acting theophylline, long-acting anticholinergs) and systemic Steroid-Sparing therapy.

- Inhaled steroids most preferred (due to the high therapeutic index - the effectiveness / safety) controlling inflammatory agents in patients with persistent asthma of all severity. Inhaled glucocorticosteroids suppress airway inflammation, lower elevated bronchial hyperreactivity, improve lung function, outpace, control symptoms, reduce the frequency and severity of exacerbations, improve the quality of life for patients with asthma, reduce mortality in asthma.
 - Given the mechanism of action, treatment with inhaled glucocorticosteroids should be for a month or slightly longer reduces airway inflammation, while bronchial hyperresponsiveness decreases much more slowly. Established comparative daily doses of inhaled corticosteroids. capacity of approximately equal steps of different doses of inhaled corticosteroids applied

through various inhalation devices DELIVERY. A dose of 500 micrograms of beclomethasone dipropionate daily or equivalent to the strength of the dose of inhaled corticosteroids other disease control in most patients. Established comparative daily doses of inhaled corticosteroids.

Long-acting bronchodilators used in the treatment of asthma

Preparations	Dose (mg)	Duration (h)
β 2-agonists, long-acting		
Salbutamol	25,50	12 +
Formoterol	4,12	12 +
Long-actinanticholinergics		
ipratropiumbromide	18	24+

Preparations ambulance that is used to relieve acute bronchospasm and other symptoms of asthma

Preparations	Dose (mg)	Duration (h)
β 2-agonists short action		
Salbutamol	100	4-6
Formoterol	100	4-6
Long-actinganticholinergics		
ipratropiumbromide	20, 40	6 – 8
Combination products (β 2-agonists short-acting + short-acting anticholinergics)		
+ fenoterol ipratropiumbromide	50/20	6-8
+salbutamol ipratropiumbromide	120/21, 100/20	6-8

The most effective bronchodilators used as needed, are β 2-agonists short action. In the case of a patient one or more clinical signs of a degree of severity of the disease prescribe the appropriate treatment regimen.

Step approach to pharmacotherapy of patients with asthma. It should comply stepped approach to prescribing drugs to achieve - to increase the number and frequency of medication in decreasing the severity of asthma.

Level number 1 - Intermittent asthma.

Treatment - symptomatic, if necessary:

- Inhaled β 2-agonists short action if necessary (if the symptoms) - the first choice.

- Prophylactic inhalation β 2-agonists short action before exercise or before a likely allergen exposure. Other bronchodilators (inhaled anticholinergics short-acting oral β 2-agonists short-acting, short-acting theophylline) have a slower onset of action and / or a greater risk of adverse symptoms.

- If there is a need for bronchodilators more than 1 time per week for more than 3 months or if the LUNGS FUNCTION in the periods between relapses are not back to normal - you need to check the severity, perhaps in light of the patient persistent asthma.

Degree number 2 - Easy persistent asthma

Treatment - symptomatic therapy plus one controlling means:

- Daily regular treatment with anti-inflammatory drugs to achieve and maintain control of asthma.

- Preference is given to the appointment of inhaled corticosteroids in low daily doses. The daily dose can be designed for 1 admission for some.

- Alternative medicines control: cromones, leukotrienes modifiers - are less effective than inhaled steroids; long-acting theophylline - has weak anti-inflammatory action, the application associated with significant side effects.

- Symptomatic therapy inhaled β 2-agonists short action if necessary - first choice. Other bronchodilators, inhaled anticholinergics short-acting oral β 2-agonists short-acting, short-acting theophylline - have a slower onset of action and / or a greater risk of adverse symptoms.

Level number 3 - Central persistent asthma severity. Treatment - symptomatic therapy plus one or two controlling means:

- Daily regular treatment with anti-inflammatory drugs to achieve and maintain control of asthma.

- It is recommended inhaled corticosteroids combined reception in low doses and inhaled β 2-agonists, long-acting, as in some DELIVERY devices, and in a fixed combination. The fixed combination in one dosage form of inhaled corticosteroids and inhaled β 2-agonist prolonged action improve compliance (a convenient way to deliver drugs, usually pharmacoeconomic best performance). Remember that β 2-agonists as monotherapy prolonged without Inhaled glucocorticosteroids are not appointed.

Another option - the appointment of medium or high daily doses of inhaled Glucocorticosteroids.

Another option - a combination of inhaled corticosteroids in low doses with leukotriene modifiers; theophylline prolonged (greater risk of side effects).

Symptomatic therapy: inhaled β 2-agonists short action if necessary - first choice. Other bronchodilators, inhaled anticholinergics short-acting oral β 2-agonists short-acting, short-acting theophylline - have a slower onset of action and / or a greater risk of adverse symptoms.

Level number 4 - Severe persistent asthma

Treatment - symptomatic therapy plus two or more control means.

The advantages of a combined method of inhaled corticosteroids in the middle - high daily doses in combination with inhaled β 2-agonists long-acting, perhaps in a dosage form.

With the lack of effectiveness of the combination of leukotriene modifiers appointment of additional and / or theophylline prolonged action.

If necessary in severe uncontrolled asthma with daily activity limitation with frequent exacerbations additionally a long term oral glucocorticosteroids administered in the lowest possible doses to achieve the effect. If a patient is transferred from oral Glucocorticosteroids to high doses of inhaled corticosteroids should be carefully monitored signs of adrenal

insufficiency.

Symptomatic therapy - β 2-agonists short action needed. Other bronchodilators - inhaled short-acting anticholinergics, combination with β 2-agonists short-acting oral β 2-agonists short-acting, short-acting theophylline (not used if the patient gets prolonged theophylline).

At low clinical and functional effects of oral corticosteroids, severe systemic side effects of their use, no effect of other drugs, appointed sparing therapy with Immunosuppressant (methotrexate, cyclosporine A, preparations of gold). This evaluated their effectiveness in trial date. However, this treatment is effective, low and side effects that occur may be more severe than with steroids. Steroid-sparing therapy can be used only when clearly proven benefit in the treatment of asthma. The relation between risks and benefits provided by the use of treatment regimens should inform the patient, and treatment centers to carry out under the supervision of professionals with experience and controls for such treatment, monitor the general condition of the patient.

Remember that difficult for the treatment of persistent asthma may be a harbinger life-threatening undiagnosed disease syndrome (Chardzha-Strauss other forms of systemic vasculitis) that appropriate regimens. The complex uses numerous daily medications in the treatment of severe persistent mode asthma leads to a decrease compliance patient, making it difficult to achieve the effectiveness of treatment. It is especially necessary to control intensive training skills and constant support for patients.

Severe asthma poorly controlled

Patients with severe asthma require observation in specialized centers asthma, regular consultations 6-12 months to clarify the causes of severe course, assess response to treatment and its correction. If when using the treatment of severe asthma (by IV degree), the disease is not controlled, the question of the appointment for the long standard treatment of oral steroids; before taking a decision on such a therapy, it is advisable to consult a patient to a specialist, pulmonologist, allergist, otolaryngologist, etc. The purpose of the consultation can be further diagnosis; in-depth study of functional lung determines the phenotype of asthma. Please re-evaluate the patient compliance, machinery and completeness before execution of this treatment, the impact of trigger factors.

Long-term therapy with oral corticosteroids should appoint only the case when other methods are ineffective treatment of asthma, including inhaled steroids in high doses in combination with long-acting bronchodilators. Initiation of therapy with oral corticosteroids is recommended only continue when possible to reduce the clinical symptoms, the degree of obstruction and frequency of severe exacerbations. Long-term excess dose 10 mg of prednisone a day are at high risk of complications known hormone therapy, adrenal insufficiency and hormonal dependence.

To reduce complications and side effects during the basic treatment is recommended to use a short-acting drugs (prednisone, methylprednisolone), a daily maintenance dose to take in the morning and, if possible, go to the intermittent mode of treatment.

During treatment with systemic corticosteroids should follow certain recommendations for food (sufficient high-grade protein, high in potassium, ascorbic acid and reducing sodium chloride). Treatment with oral steroids for a long time (more than 3 months) or often (3-4 times a year) courses of their use is the risk of systemic side effects that need to be monitored (control of body weight, blood pressure, blood sugar).

In order to achieve asthma control is desirable to use the minimum effective doses of systemic corticosteroids, and if possible it is recommended to reduce their dose or stop taking them altogether by going to high doses of inhaled corticosteroids (2000 mg / day), a combination of recent and long-acting bronchodilators. When asthma manifests severe course its recommended

to:

- An attempt to transfer the patient with oral corticosteroids to inhaled in high doses in combination with long-acting β 2-agonists;

- An Attempt use of combination therapy - inhaled corticosteroids in combination with long-acting β 2-agonist + theophylline, leukotriene modifier or /+ long-acting anticholinergics, or /+ antioxidant or/+ anti-IgE;

- Attempt to reduce the dose of oral corticosteroids - a combination of inhaled glucocorticosteroids;

- Sparring therapy with oral corticosteroids with methotrexate or cyclosporine, drugs or gold;

- Monitoring and correction of complex circuits side effects of combination therapy;

- Working out and implementation of individual tactics correction of possible acute manifestations of asthma.

Asthma - variable disease, the severity of which can vary spontaneously or under the influence of treatment. The use of inhaled corticosteroids leads to long-term reduction of disease severity. If there within 3 months of control over the disease course of treatment scheme that meets prescribed for a patient degree of asthma control may gradually weaken supportive therapy, carefully go to the treatment scheme of a lower degree, which will help determine the minimum required to maintaining control volume therapy. Reducing the dose corticosteroids conducted gradually. In patients who achieved and maintained asthma control at lower doses of inhaled corticosteroids can refuse adjuvant therapy. As the intensity of treatment is recommended to view the treatment of asthma, which is conducted each month.

In situations where the patient's prescribed treatment does not provide adequate control of symptoms and functional impairment, treatment should be strengthened - go for treatment under the scheme a higher classification degree. However, you must first ensure the correctness of the implementation sick doctor's prescriptions. Patients should be informed of the early symptoms of asthma exacerbation, teach him to control his condition, peak flowmetria conduct, develop rules of conduct of the patient, which can prevent unintended consequences of their violations. Thus, the proposed stepped approach to asthma treatment involves getting control of the disease with the use of adequate minimum drugs.

Features of certain groups of asthma with difficulty in diagnosis and treatment

Based on the concept of the unity of the airways (airways - a single unit), topical treatment of comorbidity - asthma and allergic rhinitis (AR).

AR, combined with asthma - the only chronic inflammatory respiratory disease, which caused a large number of cells and mediators of allergic inflammation. Environmental factors that contribute to the development of AR in predisposed to the disease are similar to those of people with asthma.

Clinical symptoms of AR: rhinorrhea, nasal nose, itchy nose, sneezing. Manifestations of AR symptoms occur or worsen when exposed to allergens. Instrumental and laboratory tests:

- X-ray of the sinuses;

- Endoscopy;

- Study of smell;

- Research nasal flushing.

Allergy research:

- Allergic history;

- Leather positive tests with allergens;

- High level of general and specific Ig E.

Pharmacotherapy patients with AR, combined with asthma. Drug therapy of patients with AR, combined with asthma spend using different routes of administration of drugs - inhaled, nasal, oral and parenteral.

Groups of drugs that are recommended for treatment of AR

<i>Name of pharmacological agent</i>	Substance
Antihistamine preparations	fexofenadine, desloratadine, loratadine, cetirizine, ketotifen, hifenadynu hydrochloride
Wound healing non-steroidal agents	Cromolyn sodium
Intranasal steroids	Fluticasone propionate, mometasonefuorat, beclomethasonedipropionate
Systemic corticosteroids	prednisolone, methylprednisolone, dexamethasone, hydrocortisone acetate
Local vasoconstrictor means (decongestants)	xylometazoline, oxymetazoline, nafazolina, tetryzolin
Combination drugs: antihistamines + vasoconstrictor	phenylephrine + dimetindena maleate, nitrate + nafazolinaantazolinamesylate

AR classified considering the duration of symptoms and severity of the disease based on symptoms and quality of life of patients, emit intermittent (episodic) course, persistent (permanent) course: easy, moderate and hard.

In the treatment of AR, combined with asthma, consider the following destination therapy:

- Rationally conditioned appointment and management of drug therapy;
- Elimination of allergens and control of the environment should accompany drug therapy;
- The severity of clinical symptoms of AR and bronchial asthma determine the treatment and destination of the combination drug therapy;
- To be followed degree like approach to prescribing drugs - increase the number and frequency of medication with increasing severity, symptoms and decreasing the intensity of pharmacotherapy reduced.

Mild intermittent or persistent allergic rhinitis: clinical symptoms before treatment (rhinorrhea, nasal nose, itchy nose, sneezing) do not violate the sleep of patients. Daily activities, sports and

entertainment are maintained. The symptoms do not interfere with normal activities like professional training and school.

Treatment. Nasal and / or systemic antihistamines or cromolyn . In case of inadequate control of the disease, prescribe intranasal steroids. **Symptomatic therapy.** Treatment of allergic inflammation unified in a single respiratory system (upper and lower airways) only the most effective pharmacological substance are used (fluticasone propionate, mometasone fuorate or beclomethasonedipropionate in appropriate doses depending on the severity of the disease).

Medium / severe intermittent or persistent allergic rhinitis: clinical symptoms before treatment (rhinorrhea, itching of nose, sneezing) violate patients sleep. A significant violation in doing daily activities; leisure and inability to exercise. The symptoms interfere with normal activities such as jobs, training and school.

Treatment. Assign intranasal steroids and / or oral antihistamines. In case of inadequate control of the disease, add a short course of topical or oral decongestants and / or a short course of oral corticosteroids. Decongestants (α and β -agonists) are administered topically in the form of drops or spray for 3 - 10 days. Appointment of decongestants for more than 10 days can lead to adverse effects, such as medical rhinitis. When rhinorrhea resistant - anticholinergics, use nasal spray. In case of comorbidity (nasal septum deviation, turbinate hypertrophy, chronic polypous ethmoiditis) - recommended surgical treatment in ENT - department.

cough -predominant asthma (CPA)

There is a separate variant asthma (cough asthma (CPA) as the main or even the only one of its clinical manifestation is dry nonproductive cough attacks, which are the equivalent of asthma attacks, which complicates diagnosis compared to typical asthma.

The differential diagnosis consists of non-obstructive chronic bronchitis, COPD, gastroesophageal reflux, chronic sinusitis, and chronic pharyngitis. Hacking dry cough can occur for diseases and conditions that require taking angiotensin-converting enzyme, β -blockers.

Given that the coughing attacks occur mostly at night, rates of spirographic study LUNGS FUNCTION shows mainly normal values.

The diagnosis of CPA is established after additional examination of the following:

- Accurate medical history (personal and family history of atopic focus on); determination of the cough score (similar to asthma-account), seasonal cough, cough frequency during the day, the factors that cause cough, pre-treatment.
- Conduct allergy tests with common allergens.
- The presence of bronchial hyper-responsivity on performing of bronhprovokations tests with acetylcholine, methacholine, histamine (FEV1 <8 mg / mL).
- Reduced coughing occurrence under the influence of bronchodilator therapy β 2-agonists short action).

- Availability positive (> 200 mL or > 12% of appropriate values) FEV1 response in the sample of daily bronchodilators and identify varibel (20-30%).

- Cytological examination of sputum (the presence of eosinophilia). Pathomorphological signs and pathophysiological mechanisms of cough variant asthma and persistent asthma. Given the clinical and functional manifestations, CPA is a variant of mild persistent asthma (II degree). Treatment is appointed in accordance with the severity of the disease.

Bronchial asthma combined with chronic obstructive pulmonary disease

Asthma and COPD - diseases with bronchial obstruction but separate different pathogenesis, tactics, response to treatment, prognosis, but they have much in common. Both - chronic inflammatory diseases involve the distal small airways and are characterized by airflow limitation in the lung. The results include bronchial mucociliary dysfunction and smooth muscle spasm bronchial and hyperresponsiveness characteristic of the bronchi.

Both diseases result from genetic and environmental interactions and both are treated almost by the same drugs.

When asthma and COPD are combined the situation which lines the clinical and functional characteristics of asthma and COPD, and management of these patients is particularly challenging.

Usually this associated pathology occurs in older people, with a long history of a disease. The situation of accession to COPD from asthma is more frequent. In the case of primary BA:

- Usually there presence of a history of poor control is recognized, low use of the basic anti-inflammatory therapy, or continued smoking;
- Still intact with bronchodilator response to β 2-agonist, decreases in FEV1 and daily variability
Volume of exhale
- A need to increase the dose of glucocorticosteroids compared to what it was in previous assignments is required that is if patient was previously using them. If steroids are used for the first time, the response to them is quite low, symptoms are not controlled, and there are weak dynamics of respiratory function;
- Changes in breathlessness. Previously she worried sick attacks, the accession of COPD is a constant, gradual increases on exertion, shortness of inspiration is stated more than trachea/
- Gradually reduction of response to bronchodilators showing an accelerated annual decline in FEV1;
- There are clinical and functional signs of systemic effects of COPD.

Asthma develops in the COPD if:

- Against the background of a rather monotonous disease wavy symptoms occur including - attacks of coughing, asthma, night episodes of bronchial obstruction;

- In increasing bronchial hyperreactivity, increased differences in terms of morning and evening pifluometry;
- Acute symptoms effectively reduce with bronchodilators, and at a fairly prolonged use - inhaled corticosteroids.

In medicinal algorithm patients with comorbidity come to the fore complex treatment with standard treatment - inhaled steroids in high doses + β 2-agonists, long-acting (less effective routine use of β 2-agonists short action) + anticholinergics prolonged action (less effective for routine use short acting choilinolytics) \pm theophylline prolonged action. Recommended drug with antioxidant action for example N-acetylcysteine.

In the basic treatment can be used as a short-acting bronchodilators combined (β 2-agonists short-acting anticholinergics + short-acting).

Allergen-specific immunotherapy (ASI) in asthma

ASITA - treatment of the cause and important allergens (allergovaccines) are introduced into the body of the patient in increasing doses to reduce sensitivity to allergens etiologically significant in their natural exposure. The mechanism of action ASI is by - switching the immune response of Th-2 type on Th-1 type, increasing anti-inflammatory cytokines. This inhibits IgE-caused allergic inflammation, specific and nonspecific bronchial hyperreactivity. The biggest benefit of the application of ASI is observed in allergic rhinitis, atopic asthma, insect allergies, and asthma combined allergic rhinitis.

ASI efficacy in asthma leads to:

- Decrease in the sensitivity to the cause and significant allergen and, consequently, prevent and reduce symptoms;
- Reducing drug load, the need for basic medicines and symptomatic therapy;
- Long-term maintenance of a positive clinical effect;

ASI administration is possible in asthma:

- If not severe asthma;
- FEV1 > 70% after adequate adequate pharmacotherapy;
- If symptoms are not adequately controlled by removing allergens and using pharmacotherapy;
- If pharmacotherapy leads to unwanted side effects or contraindications to it there; A high therapeutic index efficacy is achieved by careful selection and management of patients by ASI :
- The presence of IgE-dependent mechanism of asthma (atopy);
- A limited number of causative allergens;
- The use of standardized and high-quality allergovaccines ;
- Achieving remission or control the disease by using drugs;

- Consent of the patient and susceptibility to long-term (over the years) and regular treatment
ASI.

Contraindications of ASI in asthma.

- Severe asthma or complexities;
- Pregnancy;
- Infectious diseases;
- Treatment with β -blockers;
- Diseases of the immune system, psychological system, hematologic, cancers;
- Low level of implementation of recommendations of the doctor patient (low compliance).

Aggravation of asthma.

Aggravation of asthma – consists of episodes of progressive reduction of difficulty in breathing, coughing, wheezing, chest tightness, or a combination of these symptoms. Reduction in flow of air on exhalation occurs (quantitatively determined by measuring FEV1 and Volume of exhale.). These indicators measure the LF – are a more reliable indicator of the degree of airway restriction than clinical symptoms. However, symptoms can be a more sensitive early indicator of acute attack; in as far as an increase in symptoms usually precedes the deterioration in peak expiratory flow rate. A small proportion of patients have observed significant violations of functional parameters with no significant worsening of clinical symptoms (this is typical for patients with a history of near-fatal asthma more common in men).

Exacerbation severity will determine the location and volume of treatment. Indicators that reflect the severity of the patient (Volume of exhale, heart rate breathing rate) should monitoring for treatment of asthma exacerbation.

Severe exacerbation can be potentially life-threatening to the patient; their treatment requires close medical monitoring. Most patients with severe exacerbation should be treated in hospital.

Patients at high risk of death from asthma also need more attention. For such patients typically include:

- A history of episodes of near-fatal asthma requiring intubation and mechanical ventilation;
- Hospitalization or urgent appeal for help due to asthma within the past year;
- The present application or recent discontinuation of oral corticosteroids;
- No previous use of inhaled corticosteroids;
- Increased reliance on inhaled β_2 -agonists short action (the use of more than one canister of salbutamol (or equivalent) per month);
- History of mental illness, psychosocial problems, including the use of sedatives;

- Lack of compliance and non-compliance with the treatment plan of asthma.

Patients in this category must at the first sign of asthma exacerbation quickly contact a doctor.

Light exacerbation of asthma can be treated as outpatients.

The severity of asthma exacerbation.

The severity of asthma exacerbation is measured by the analysis of anamnesis, severity of manifestations of clinical symptoms and signs and functional impairment of breathing and circulation:

- History (severity and duration of symptoms, including limiting physical activity, sleep disorders, treatment, carried out at the time given doses DELIVERY devices; dose. Which the patient received before the escalation, changes in treatment after the onset of exacerbation response of the patient (or lack thereof) to this therapy, the start time and aggravation if probable cause, the presence of risk factors for death from asthma);

- Physical examination - a state of mind (speaking phrases, sentences, etc.), assessment of heart rate, RR; or marked part supporting muscles and other symptoms;

- To determine the seriousness and severity of exacerbation of bronchial obstruction, hypoxemia strongly recommended functional assessment (Volume of exhale, FEV1, SaO2), so far as a physical examination cannot provide such estimates; Volume of exhale FEV1 measurements are necessary to the beginning of treatment and periodically repeated exacerbation during the treatment until you got a clear response to therapy. Determination of blood oxygen saturation (pulsometer) should also be conducted periodically in severe exacerbations;

- In patients with severe exacerbation (FEV1 at thirty - 50% of predicted) who do not respond to initial treatment, or the deterioration of recommended determination of arterial blood gases. RaO2 <60 mm Hg. ART under normal or increased RaS02 (especially > 45 mm Hg. ART) indicates the presence of lung failure

There are 4 types of exacerbation severity: mild, moderate, and severe threat to stop breathing. Such a classification allows us to differentiate the exacerbation of asthma severity - from mild to asthmatic condition, prescribe the necessary volume of the treatment and its objective control

Symptoms of asthma exacerbation severity

Symptom	Severity of exacerbation			
	<i>light</i>	<i>Middle</i>	<i>severe</i>	<i>Hard to threat</i>
1	2	3	4	5
Dyspnea in patient	When walking.	Can talk	Is silent Mainly in forced	

	Can lay down	Is mainly seated	forward position	
Conversation	Sentences	Phrases	Words	
Consciousness	Possible excitement	Highly excited	high excitement	confusion
Respiratory rate	Increased	Increased	Often greater than 30	
Participation in breathing, supplementary muscles, suprasternal refraction	Definitely not	Usually present	Usually present	Paradoxical thoraco abdominal movements
Wheezing	Moderately expressed at the end of exhalation	loud	Very loud	Like a whistle
Pulse / min	< 100	100-120	> 120	bradycardia
paradoxical pulse	pulse missing <10 mm Hg. Art.	determined 10-25 mm Hg. Art. Often	defined by > 25 mm Hg. Art.	Lack involves muscle fatigue
Volume of exhale after taking bronhiolitik% of appropriate values or best for patients	>80 %	= 60-80%	< 60% (< 100 / min.) Or the response is stored <2 hours	
PaO2	normal	> 60 mm Hg	< 60 mmHg	
PaCO2	< 45mmHg	< 45 mmHg ART	> 45 mmHg ART and possible pulmonary insufficiency	
SaO2	> 95 %	91-95 %	< 90 %	

Treatment of patients with acute exacerbation of asthma

The goal of treatment – is to quickly reducing airway obstruction, hypoxemia and develop a plan to prevent further deterioration. Treatment and response should be immediately monitored (clinical symptoms, objective signs) until the function parameters (FEV1, Volume of exhale.)return to the best for the patient (ideally), or stabilized.

Light to moderate acute disease can be treated as outpatients. If the patient responds to the increase in treatment - the need for treatment in the emergency department, the patient remains under the supervision of a district doctor .Patient education is recommended, and reviewing the therapy.

Severe exacerbation of the patient is life-threatening and requires treatment in hospital (emergency department).

Hospital treatment stage	
Initial assessment of exacerbation severity	
History, physical examination (participation in an auxiliary breathing muscles, auscultation, heart rate, RR, Volume of exhale, FEV1 SaO ₂ , measurement of arterial blood gases in very severe cases, other studies indicated)	
The initial phase of treatment:	
<ul style="list-style-type: none"> - Oxygen therapy to achieve the level of SaO₂> 90% - Inhaled β₂-agonists quick action continuously for 1 hour (recommended by nebulization) - Systemic steroids (in the absence of immediate response to treatment or patient recently took oral steroids or severe asthma attack) - Sedatives are contraindicated during exacerbation 	
Reevaluation after 1 hour	
Physical examination Volume of exhale, SaO ₂ , other studies on the testimony	
<u>Worsening moderate stage :</u> <ul style="list-style-type: none"> - Volume of exhale 60-80% of predicted or best for the patient; - Moderate manifestation of symptoms involved in respiration auxiliary muscles. Treatment: <ul style="list-style-type: none"> - Oxygen therapy; - Inhaled β₂-agonists, anticholinergics + 	<u>Worsening severe stage</u> <ul style="list-style-type: none"> - A history of risk factors for near-fatal asthma; - Volume of exhale<60% of predicted or best for the patient, - Pronounced signs of symptoms at rest, chest retraction; - No clinical improvement after initial treatment. Treatment:

every hour; - Oral steroids; - To continue treatment for 1-3 hours to improve	- Oxygen therapy; -inhalation of β 2-agonists, anticholinergics +; - Systemic glucocorticosteroids.
<i>Reevaluation after 1-2 hours</i>	

Oxygen - appointed in $SaO_2 > 90\%$ by nasal cannula mask. When using 100% oxygen in selected patients with more severe obstruction condition may worsen $RaSO_2$. To maintain a satisfactory level of oxygen saturation, oxygen therapy should titerised according pulsoximeter indicators.

Inhaled β 2-agonists are appointed at regular intervals. Based approach in hospitalized patients - first continuous therapy by nebulizer, then the transition to intermittent therapy follows.

B2-agonist combination with anticholinergics ipratropium bromide can contribute to a more pronounced effect than the use of each drug separately.

Systemic steroids accelerate the treatment of exacerbations and may be administered, even in very light, exacerbations when:

- Initial therapy with inhaled β 2-agonists quick action prevents achievement of lasting improvements;
- Exacerbation develops in the patient receiving oral corticosteroids;
- Pre-treatment exacerbation needed oral glucocorticosteroids. Oral steroids are not less effective than intravenous but require about 4 hours before clinical improvement. The daily dose of 40 mg methylprednisolone or 200 mg hydrocortisone is usually sufficient in most cases, but can be used and higher doses can be used - 60 - 80 mg of methylprednisolone (or equivalent), or 300 - 400 mg of hydrocortisone. Duration - 7 - 14 days.

An alternative to systemic corticosteroids may be inhaled glucocorticosteroids in very high doses.

After discharge from the ICU recommended:

- A course of oral corticosteroids - a minimum of 7 days against a background of continuing bronchodilator therapy;
- Bronchodilators;
- Start or continue taking inhaled corticosteroids;

- Periodically checking technique possession DELIVERY devices and peak flow meter;
- Identify all possible factors that provoke the aggravation and work out and implement strategies to address them;
- To assess patient response to aggravation and writing a plan to correct a patient with asthma;
- Review controlling therapy, conducted during exacerbations, whether it was timely raised , how much, and if appropriate, why designed oral steroids were not used ;
- Recommended to contact the district physician within 24 hours after discharge. Subsequent visits to the district physician, family doctor or specialist to make asthma problems for several weeks in order to monitor state to improvement and achieving personal best options LUNGS FUNCTION.

The development of severe asthma exacerbation requiring hospitalization, and indicating the shortcomings of individual plan of the patient. Hospitalized patients are most favorable to perception of information and advice about their disease, so they should use this opportunity to ensure:

- Whether they understand the causes of aggravation;
- Do you know how to warn factors that cause it (including, if it is important for the patient to stress the extremely deleterious role of smoking);
- Whether they are aware of the purpose of prescribing various steps for the treatment of asthma (for the basic anti-inflammatory therapy, to relieve attacks, etc.), or properly use drugs and devices DELIVERY;
- Does the patient recognize signs of aggravation and measures to be started due to deterioration of symptoms or decrease Volume of exhale.

For patients who were hospitalized recommended to consult a specialist on the problems of asthma (pulmonologist, allergist). After discharge from the hospital the patient should be under regular supervision of the district, family doctor or a specialist in asthma problems for several weeks until the ERF will not return to normal / best for the patient parameters.

Prophylaxis

.Primary prevention aims to complete the treatment of acute and chronic respiratory diseases, sanitation foci of chronic infection nasal and paranasal sinuses, strengthening of the body to improve its resistance to colds and eliminate occupational hazards. Removal from the environment of the patient potentially dangerous allergens (hypoallergenic diet, smoking is prohibited).

Secondary prevention combines not only the treatment of asthma, but also rehabilitation in different clinical stages. Treatment should be integrated with the appointment of bronchodilators, antimicrobial, secretolytic, and desensitizing drugs. These are also used methods of specific and nonspecific hyposensitization.

Control of initial level of knowledge

"Asthma"

1. The main complaint for patients with asthma are:

- A. Cough with a large amount of phlegm.**
- C. Frequent unproductive cough.**
- C. Expiratory dyspnea.**
- D. Periodic bouts of breathlessness.**
- E. Inspiratory dyspnea.**

2. The leading risk factors for asthma are:

- A. Burdened regarding asthma and other allergic diseases heredity.**
- B. Contact with domestic animals, birds, mold, yeast fungi and other allergens.**
- C. Inefficiently treated bronchitis, pneumonia.**
- D. The work in dusty, gassed.**
- E. All of the above.**

3. The immunological mechanisms of asthma include all of these, except one:

- A. Activation basophilic leukocytes.**
- B. Hypereosinophilia.**
- C. activation synthesis reagin.**
- D. Glucocorticoid deficiency.**
- E. Hypersensitivity reaction negative type.**

4. The basic mechanisms of wheezes in asthma patients are:

- A. Spasm of small bronchi.**
- B. Obturation small bronchi.**
- C. Obturation of the bronchi of small caliber.**
- D. Dyscrinia.**
- E. Defeat alveoli.**

5. Auscultation most complete picture of an exacerbation of asthma presented:

- A. Brash vesicular breathing and humming, wheezing.**
- B. Brash vesicular breathing with prolonged exhalation.**
- C. Brash vesicular breathing with prolonged exhalation and mainly dry whistling wheezing.**
- D. Weakened breath wheezing and whistling.**
- E. Bronchial wheezing breath and wet.**

6. In bronchial asthma in sputum are:

- A. Atypical cells.**
- B. Eosinophils, Charcot-Leyden crystals, spiral of Kurshman.**

- C. Erythrocytes as coin columns.**
- D. A large number of elastic fibers.**
- E. neutrophils, alveolar epithelium.**

7. The most information on presence of bronchial obstructive changes make the following indicators of external breathing:

- A. Respiratory volume (TO).**
- B. Vital capacity (VC).**
- C. Forced expiratory volume in the first second (FEV1).**
- D. Reserve inspiratory volume (ROVD).**
- E. Evaluation of all these indicators together.**

8. In mild persistent asthma should:

- A. Take treatment only during exacerbations of the disease.**
- B. Take medical treatment mucolytics 1 every 3-4 months.**
- C. Continuously, regardless of the disease, take inhaled medicines.**
- D. Constantly, regardless of the disease, take bronchodilating drugs.**
- E. In remission conduct courses supporting desensitizing therapy.**

9. What preparations have Bronchodilation action:

- A. Beklofort.**
- B. Flyksotyd.**
- C. Budesonide.**
- D. All of the drugs.**
- E. None of these drugs.**

10. What preparations have anti-inflammatory effect:

- A. Beklofort.**
- B. Flyksotyd.**
- C. Budesonide.**
- D. All of the drugs.**
- E. None of these drugs.**

Control of final level of knowledge

1. "Asthma - a chronic inflammatory disease of the airways in which development involving mast cells, T lymphocytes, macrophages." This definition should be supplemented:

- A. "And that is characterized by reversible variable bronchial obstruction."**
- B. "And that is characterized by bronchial hyperreactivity."**
- C. "And what is the genetic predisposition."**
- D. All of the above.**
- E. There is no need in addition, because the definition is complete.**

2. In any pathological condition in patients with asthma obstructive changes are irreversible:

- A. When bronchial smooth muscle spasm.**
- B. In mucosal swelling of the airways.**

- C. The formation of viscous secretion and obstruction of small bronchi.**
- D. When sclerotic changes in the bronchial wall.**
- E. When all of these.**

3. Bronchial obstruction in asthma is caused by:

- A. Bronchial smooth muscle spasm.**
- B. Swelling of bronchial mucosa.**
- C. Dyskrynia.**
- D. The functional instability of the airways.**
- E. With all these factors.**

4. Use a peak flow meter cannot:

- A. Predict exacerbation.**
- C. Evaluate the effectiveness of the bronchodilator drug.**
- C. Plan basic therapy.**
- D. Evaluate variability of bronchial obstruction.**
- E. Bronchial hyperreactivity diagnose.**

5. The conventional monitoring the clinical course of asthma at this time are:

- A. Study expiratory flow rate (PEF) using a peak flow meter.**
- B. Learning curve parameters "flow-volume".**
- C. The test with bronchodilators.**
- D. Setting provocation tests with histamine.**
- E. Setting provocative tests with acetylcholine.**

6. In the course well controlled asthma rates peak expiratory flow rate:

- A. There should be almost the same in the morning and evening.**
- C. In the morning should be much higher than in the evening.**
- S. In the evening should be much higher than in the morning.**
- D. There should be minimal in the morning and gradually increase the evening.**
- E. A should be as in the morning and gradually decline evening.**

7. Development is possible complication in patients with asthma:

- A. Empyema.**
- B. Gangrene of the lungs.**
- S. Lung abscess.**
- D. Pleural effusion.**
- E. Asthmatic status.**

8. selective β 2-stimulants include:

- A. Ephedrine.**
- B. Zaditen.**
- C. Eufillina.**
- D. Salbutamol.**
- E. Platifillin.**

9. What preparations have bronchodilation action:

- A. Salbutamol.**
- B. Ventolyn.**
- C. Serevent.**
- D. All of the drugs.**
- E. None of these drugs.**

10. For a long planned treatment patient with asthma drugs most expedient to appoint the following groups:

- A. Inhaled β 2-agonists.**
- B. Prolonged theophylline.**
- C. Membranostabilizer.**
- D. Inhaled glucocorticosteroids.**
- E. Systemic glucocorticoids.**

Situational tasks.

1. A woman, 25 years old, 1.5 years is at the dispensary on bronchial asthma. Recently asthma attacks occur 4-5 times a week, night attacks - 2-3 times a month. For relief applies salbutamol. Skaryfikations test antigen positive domestic mites. OBJECTIVE: relatively satisfactory state, BH - 20 for 1 min, CHSS- 76 for 1 min, blood pressure - 120/80 mmHg In the lungs vesicular breathing. Dult cardiac rhythm correct. What mechanism is leading in the development of bronchial obstruction in a patient?

- A. Bronchial hyperreactivity**
- B. Arahidonic acid metabolism**
- C. Adrenergic imbalance**
- D. Increased tone of the parasympathetic nervous system**
- E. Tracheobronchial dyskinesia**

2. The patient, 48 years old, over the last 10 years suffering from asthma. While working on their summer cottage feel shortness of breath, cough, wheezing distance began to grow short of breath. The drug whose pharmacological group to recommend the best patient to relieve breathlessness such attacks?

- A. β 2-adrenergic stimulator**
- B. Blocker β 2 adrenergic**
- S. Membrane stabilizer of mast cells**
- D. Methylxanthine**
- E. Inhaled glucocorticoid**

3. Patient N., 30 years, complains stuffy nose, asthma attacks at night once a week. Ill after a respiratory infection, which was treated with acetylsalicylic acid alone. In the analysis of blood and sputum eosinophilia detected. What is the most likely diagnosis?

- A. Asthma aspirin**
- B. Asthma physical exercises**
- C. Asthma, endogenous form**
- D. Bronchial asthma, exogenous form**

E. Eosinophilic infiltration of the lungs

4. Patient A., 43 years old, complained of shortness of breath during exercise. OBJECTIVE: body temperature - 36,4 ° C. BH - 20 for 1 min, pulse - 78 for 1 min, blood pressure 125/80 mmHg Forms barrel chest. Above the lungs auscultated vesicular breathing weakened. What research is necessary to the patient in an outpatient setting to address the effectiveness of bronchodilators intended?

- A. Peakflowmetria**
- B. ECG monitoring overload right heart**
- C. Spirography**
- D. Bronchoscopy**
- E. Analysis of sputum (number and flora)**

5. The patient entered the clinic O., 55 years after the attack of asthma. For 20 years with the pharmaceutical factory and engaged tableting chlorpromazine, sulfanilamide. For 10 years, notes the frequent respiratory infections. Later there was shortness of breath, occasionally – sub-febrile. While working in a dusty room and out of the warm room on a cold appear asthma attack. Signs of cardiac decompensation available. What is the most likely diagnosis?

- A. Cardiac asthma**
- B. Chronic obstructive bronchitis**
- C. Bronchial asthma, infectious-allergic form**
- D. Occupational asthma, atopic form**
- E. Chronic non-obstructive bronchitis**

6. Patient suffering from asthma for over 20 years, against attacks of breathlessness suddenly appeared constant cough without phlegm, chest pain, increased shortness of breath. ECG: overload right heart. Treatment of β -adrenergic agents has no effect. What possible complications developed in this patient?

- A. Status asthmaticus**
- B. Cardiac asthma**
- S. Pulmonary edema**
- D. Pneumothorax**
- E. Thromboembolism pulmonary artery branches**

7. Patient G., 42 years old, patients with bronchial asthma appointed theophylline. If a drug whose concentration in the blood can hope for improvement in pulmonary function with no toxic effect?

- A. 21- 25 mg / l**
- B. 5-20 mg / l**
- S. 26 - 30 mg / l**
- D. 31 - 40 mg / l**
- E. 41 - 45 mg / l**

8. Patient K., 50, suffers from bronchial asthma 20 years. Developing asthma 2-3 times a week. Takes inhaled corticosteroids, salbutamol as needed. Do not tolerate ibuprofen. Notes the constant feeling of fullness in the nose. ENT discovered polyps in the nose. OBJECTIVE: rhinorrhea, BH - 22 for 1 min. CHSS- 88 for 1 min, blood pressure - 120/80 mmHg In the lungs vesicular breathing weakened, scattered dry wheezing. Which option is most likely originated asthma patient?

- A. Atopic asthma**
- B. "Aspirin" asthma**
- C. Infectious-allergic asthma**
- D. Asthma physical effort**
- E. Cholinergic asthma**

9. Patient P., 39 years old, suffering from asthma for about 5 years. The attacks of breathlessness lightweight, removable tablet of Eufillin or two breaths dosed sympathomimetic night between 4th and 5th hour there is difficulty breathing, which removed dosed sympathomimetic. What bronchodilators appropriate to recommend to the patient before bedtime to prevent nighttime symptoms?

- A. Berotek**
- B. Salbutamol**
- C. Antrovent**
- D. Eufillin**
- E. Teopek**

10. Patient L., 35, 14 years suffer from asthma. Recently asthma attacks occur 4-5 times a week, night attacks - 2-3 times a month. For cupping uses salbutamol. Objectively: state is satisfactory. BH - 20 for 1 min, heart rate - 76 for 1 min, blood pressure - 120/80 mm Hg. Art. In the lungs vesicular breathing. Heart sounds are muffled rhythm correct. What preparation is to be assigned for the prevention of asthma attacks in the first stage?

- A. Corticosteroids injected**
- B. Regular use of salbutamol**
- S. Inhaled corticosteroids**
- D. Corticosteroids tablets**
- E. Cromoglycate sodium**

Control questions.

1. Define asthma.
2. Etiology and pathogenesis of asthma.
3. Classification of asthma.
4. Characteristics of the severity of asthma.
5. Clinical manifestations of asthma.
6. Stages of BA.
7. Physical data in asthma.
8. Investigations in asthma.

9. Complications of asthma.
10. Differential diagnosis of asthma.
11. Operating scheme evaluation level of control in asthma.
12. Treatment of patients with asthma.
- 13 Step approach to pharmacotherapy of patients with asthma.
14. Specifics of certain groups of patients with asthma.
15. Treatment of cough variant asthma.
16. Allergen-immunotherapy of specific asthma.
17. Aggravation of asthma.
18. Assessment of the severity of asthma exacerbation.
19. Treatment of asthma exacerbation.
20. Prevention of asthma.

Practical tasks.

1. To provide management of patients with asthma.
2. Assess the patient's condition and results of physical examination.
3. Fill minutes Supervision patient with asthma.
4. Writing or interpreting received laboratory studies.
5. Give or interpreting received instrumental methods.
6. Treatment.
7. Prescription for the treatment of asthma.
8. Assign rehabilitation and preventive measures.

Answer Sheet

Basic knowledge

- | | |
|------|------|
| 1. D | 6. B |
| 2. E | 7. C |
| 3. D | 8. C |
| 4. A | 9. E |
| 5. C | 10 D |

The final level of knowledge

- | | |
|------|------|
| 1. D | 6. A |
| 2. D | 7. E |
| 3. E | 8. D |
| 4. E | 9. D |
| 5. A | 10 D |

Situational tasks

- | | |
|------|-------|
| 1. A | 6. A |
| 2. A | 7. B |
| 3. A | 8. B |
| 4. A | 9. E |
| 5. D | 10. E |

RECOMMENDED BOOKS:

1. Clinical Pulmonology - 2016 (The Clinical Medicine Series Book 19).-343h.
2. Pulmonary Disorders [Sect. 5, Merck manual] 2010.-123p.
3. Pulmonary Pathophysiology : The Essentials by (author) [John B. West](#) 2012 .-20
4. Davidson's Principles and Practice of Medicine 22nd Edition .-Walker, Brian R., FRSE.-2014.-1312p.

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Завідувач кафедри
внутрішньої медицини №3
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Журавльова Л.В.