

**MINISTRY OF HEALTHCARE OF UKRAINE
HSEEU "Ukrainian Medical Stomatological Academy"**

"Approved"
at the meeting of internal
medicine №1 department
Head of Department
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**GUIDELINES
FOR STUDENTS
INDEPENDENT WORK
IN THE PRACTICAL CLASSES PREPARING**

<i>Academic discipline</i>	Internal medicine
<i>Module</i>	Basics of Internal Medicine
<i>Content module</i>	Fundamentals of diagnostics, treatment and prevention of respiratory diseases
<i>Study subject</i>	Asthma
<i>Course</i>	IV
<i>Faculty</i>	of foreign students training

Poltava 2016.

1. Relevance of the topic: Bronchial asthma (BA) - an inflammatory disease of the airways, in the development of which the cells and inflammatory mediators are involved. Chronic inflammation is combined with bronchial hyperresponsiveness and is manifested by recurrent symptoms of wheezing, breathlessness, tightness in the chest, coughing, especially at night and early morning. These episodes are usually associated with widespread but variable (changing) bronchial obstruction, reversible either spontaneously or under the influence of therapy.

2. The main goal: To be able to assess the typical clinical picture of asthma, to determine tactics of treatment and prophylaxis.

Specific goals:

- To select the information indicating the presence of asthma in a patient from the data history;
- To create a scheme of diagnostic search;
- To identify the signs of asthma in an physical examination of the patient (inspection, palpation, percussion, auscultation)
- To analyze and interpret the changes in the results of the laboratory and instrumental methods of investigation, depending on the course of the disease;
- To formulate and justify a preliminary diagnosis of asthma according to classification
- To conduct differential diagnostics of diseases with the similar clinical picture;
- To develop a strategy of treatment depending on the disease and the existing complications;
- To provide medical care.
- To assess the patient's prognosis and to propose a plan of preventive actions;
- To apply deontological communication skills with patients.

3. Basic knowledge, abilities, skills (interdisciplinary integration)

Discipline	To know	To be able to
Anatomy	The structure of the bronchial-pulmonary system, blood supply, innervation	
Histology	The structure of the wall of the trachea, bronchi, alveoli in health and disease	
Regional anatomy	Interposition of the chest organs	
Physiology	Indicators of respiratory function, their value	determine the function of external respiration (breathing)
Pathological anatomy	Changes in the structure of the wall of bronchopulmonary tissue in asthma	
Pathological physiology	Pneumotachometry, spirometry, peak flow indicators depending on the type and stage of ventilatory insufficiency	Analyze the performance of external respiration
Radiology	Radiological changes at different stages of asthma	Analyze the radiological picture of the chest cavity
Propaedeutic therapy	Symptomatology of asthma and its complications	Conduct an objective examination of the patient, analyze the clinical and laboratory data results
Pharmacology	The mechanism of action, indications and contraindications for the corticosteroids, bronchodilators, expectorants prescription	Prescribe the drugs of these groups

4. Do the tasks for independent work during preparation for classes.

4.1. The list of key terms, parameters, characteristics:

Term	Definition
Bronchial asthma	Is an inflammatory disease of the airways, in the development of which the cells and inflammatory mediators are involved. Chronic inflammation is combined with bronchial hyperresponsiveness and is manifested by recurrent symptoms of wheezing, breathlessness, tightness in the chest, coughing, especially at night and early morning.
The daily PEF variability	Determination of peak expiratory flow volume for the week (morning and evening) and count the difference between the maximum and minimum parameters: $K = (\text{max PEF} - \text{min PEF}) / \text{max PEF} \times 100\%$
Allergen-specific immunotherapy	Cause significant treatment-allergens are introduced into the patient's body in increasing dosages to reduce sensitivity to allergens etiologically significant in their natural exposure.

4.2. Theoretical questions to the lesson:

1. Definition of asthma.
2. Specify the risk factors for asthma development.
3. The pathophysiological mechanisms of asthma.
4. Diagnostic criteria.
5. What is the auscultatory pattern characteristic of asthma attacks?
6. Modern classification of asthma.
7. Specify the principles and features of asthma pharmacotherapy according to modern protocols.
8. Control of asthma - what is it?

4.3. Practical tasks that are performed in class:

1. Test question:
 1. β_2 -agonists include:
 - 1) Salbutamol
 - 2) Fenoterol
 - 3) Salmeterol**
 - 4) Ventolinum
 2. Salmeterol a metered aerosol dose comprises one:
 - 1) 500 mg
 - 2) 50 mg**
 - 3) 200 mg
 - 4) 150 mg
 3. The mast cell stabilizers include:
 - 1) Theophylline
 - 2) Cromoglicate (Intal)**
 - 3) Salbutamol (Ventolin)
 - 4) Fenoterol
 4. For long-term treatment of moderate severity persistent asthma used:
 - 1) inhaled corticosteroids in a low dose
 - 2) inhaled β_2 -agonists, long-acting
 - 3) inhaled corticosteroids in a low dose in combination with β_2 -agonists**
 - 4) inhaled corticosteroids at high doses
 5. Short-acting β_2 -agonists do not include:
 - 1) Salbutamol

- 2) Fenoterol
- 3) Ventolinum
- 4) Salmeterol**
6. In modern outpatient treatment of acute asthma are used:
 - 1) β 2-agonists, short-acting oral
 - 2) short-acting β 2-agonist inhalation**
 - 3) long-acting β 2-agonist inhalation
 - 4) corticosteroids inhalation
7. In which case patients with acute exacerbation of asthma is sent to the intensive care unit:
 - 1) with moderate degree, if no response to treatment for 6-12 hours
 - 2) with severe if there is no response to treatment for 2 hours
 - 3) in case of a threat of respiratory arrest
 - 4) In all the above cases,**
8. What remedies does not apply in the treatment of asthma:
 - 1) an elimination event
 - 2) desensitization
 - 3) inhalation of herbal decoctions**
 - 4) speleotherapy
9. For intermittent asthma is characterized by:
 - 1) nocturnal seizures are not more than 2 times per month**
 - 2) the scope of the daily POSvyd > 30%
 - 3) limited physical activity
 - 4) FEV1 60-80%
10. What is the degree of asthma severity correspond to the following parameters: FEV1 > 80%, the daily PEF variations <20%:
 - 1) mild persistent
 - 2) severe persistent
 - 3) moderately persistent
 - 4) intermittent**

Topics Content

Asthma – is a chronic inflammatory disease of the airways which is caused by a significant number of cells and inflammatory mediators. Chronic inflammation is combined with bronchial hyperreactivity, manifested by recurrent symptoms of wheezing, breathlessness, tightness in the chest, coughing, especially at night and early morning. These episodes are usually associated with widespread but variable airflow obstruction that is reversible spontaneously or under the influence of therapy.

The main cellular constituents of inflammation are eosinophils, mast cells, T- lymphocytes, macrophages. Bronchial obstruction in asthma is caused by a spasm of airway smooth muscle, edema of the mucosa, dyscrinia. Hyperreactivity, both specific and non-specific - universal primary pathophysiological feature of asthma, which underlies airway instability.

BA - chronic inflammatory process that requires continuous basic treatment and not just symptomatic via bronchodilators.

Asthma severity degree is classified according to the complex of bronchial obstruction clinical and functional signs. The doctor evaluates the frequency, severity and duration of expiratory dyspnea attacks, the patient's condition during the period between attacks, severity, variability and repayment functionality bronchial obstruction, response to treatment. Evaluation of functional parameters to determine the severity of the disease is carried out in the absence of expiratory dyspnea episodes.

According to this classification the patient's condition is determined by the severity of asthma. Provided intermittent (episodic) duration; persistent (permanent) duration: mild, moderate and severe.

Intermittent asthma

Clinical symptoms before treatment

- Short-term symptoms (cough and wheezing episodes, shortness of breath) rarely than 1 time per week more than 3 months;

- Short-term exacerbations;
- Night asthma symptoms do not occur more than 2 times per month;
- Normal lung function between exacerbations;
- FEV1 or PEF $\geq 80\%$ of predicted;
- Daily variations of PEF or FEV1 $< 20\%$.

Mild persistent asthma

Clinical symptoms prior to treatment:

- Symptoms more than 1 time / week, but less than 1 time / day for more than 3 months;
- The exacerbation can disrupt the activity and sleep, there exists a need in the symptomatic treatment of almost every day;
- Night asthma symptoms more than 2 times a month;
- FEV1 or PEF $\geq 80\%$ of predicted;
- Daily variations PEF or FEV1 20-30%;

Moderate persistent asthma

Clinical symptoms before treatment

- Daily symptoms;
- Exacerbation causing disruption of activity and sleep;
- Night asthma symptoms occur more than 1 time per week;
- Daily intake of short-acting β_2 -agonists;
- FEV1 or PEF within 60 - 80% of predicted;
- Daily variations PEF or FEV1 $> 30\%$.

Severe persistent asthma

Clinical symptoms before treatment

- The constant presence of daytime symptoms;
- Frequent, severe exacerbations;
- Frequent nocturnal asthma symptoms;
- Restriction of physical activity due to asthma;
- FEV1 or PEF $< 60\%$ of predicted;
- Daily variations PEF or FEV1 $> 30\%$;

Asthma control achievements may not be possible.

The levels of asthma control

Characteristic	Controlled duration (all of the following)	Partial control (any symptom can be observed in any week)	Uncontrolled over duration
A. Assessment of current clinical signs (the last 4 weeks)			
Daytime symptoms	No (≤ 2 / week)	> 2 / week	≥ 3 signs of partial control present in every week
Activity restrictions	No	Anytime	
Nocturnal symptoms / awakening over the BA	No	Anytime	
The use of bronchodilators as needed to relieve symptoms	No (≤ 2 / week)	> 2 / week	
ERF (PEF or FEV1)	Normal indicators	$< 80\%$ of the required or personal best (if known)	

B. Assessment of future risk (risk of exacerbations, the state of instability, rapid deterioration of lung function, side effects). The symptoms that are associated with an increased risk of therapy side effects in the future: poor control of clinical symptoms, frequent exacerbations in the last year of observation, the need for resuscitation for asthma, low FEV1, exposure to passive smoking, antiasthmatic drugs high doses.

Asthma control test (Asthma Control Test - ACT; www.asthmacontrol.com) and asthma control questionnaire (Asthma Control Questionnaire - ACQ) <http://www.qoltech.co.uk/acq.html> using to assess asthma control.

Asthma diagnosis

1. Potential risk factors for asthma

1.1. Main:

- Genetic predisposition;
- Atopy;
- Bronchial hyperreactivity;

1.2. Environmental factors contributing to the development of asthma in predisposed individuals:

1.2.1. House allergens:

- House dust allergens;
- Pets allergens;
- Cockroaches allergens;
- Fungi, mold, yeast allergens;

1.2.2. External allergens:

- Plants pollen;
- Mushrooms, mold, yeast;

1.2.3. Professional sensibilization

1.2.4. Tobacco Smoke:

- Active smoking;
- Passive smoking;

1.2.5. Air pollutants:

- External;
- Home;

1.2.6. Respiratory infections (mostly viral)

1.2.7. Deficiencies in the diet

1.2.8. Consumption of certain drugs (NSAIDs, beta-blockers)

1.2.9. Obesity

1.3. Factors contributing to the development of exacerbations and / or chronic symptoms

1.3.1. Domestic and external allergens

1.3.2. Domestic and foreign air pollutants

1.3.3. Respiratory infections

1.3.4. Exercise and hyperventilation

1.3.5. Weather changes

1.3.6. Sulfur dioxide

1.3.7. Certain types of food, food additives, medicines

1.3.8. Excessive emotions

1.3.9. Tobacco smoking (active and passive)

1.3.10. Domestic life irritants

Asthma clinical symptoms:

- Episodic breathlessness with difficulty exhalation
- Cough, worse at night and physical exertion
- Episodic wheezing in the lungs
- Repeated chest stiffness

Symptoms generally worse at night and in the early morning hours, the patient awake.

Asthma symptoms appear and worsen at:

- Physical stress
- Virus infection
- Exposure to allergens (food, pets, house dust, pollen)
- Smoking
- Outward temperature difference
- Strong emotions (crying, laughing)
- Chemical sprays actions
- Taking certain medicines (NSAIDs, beta-blockers).

Violation of external respiration:

- Bronchial obstruction: a decrease in reduction in peak expiratory flow volume (PEF) and forced expiratory volume in the first second (FEV1)
- Daily variability PEF and FEV1 > 20%
- High recurrence of bronchial obstruction (increased by more than 12% (or 200 ml) and FEV1 PEV in pharmacological assays with β_2 -agonists short-acting).

Allergological data

- History: allergic rhinitis, eczema, hay fever or a family history of asthma or atopic diseases
- Positive skin tests with allergens
- Total and specific IgE elevated levels
- Bronchi hyperreactivity
- Positive provocation tests with: histamine, methacholine, physical exertion.

Asthma complications are divided into:

- Pulmonary : lung emphysema, respiratory failure, atelectasis, pneumothorax;
- Extrapulmonary: myocardial dystrophy, chronic pulmonary heart, heart failure.

Differential diagnosis. Asthma should be differentiated from diseases accompanied by bronchial obstruction. It is a ***chronic obstructive pulmonary disease (COPD)***, tracheobronchial dyskinesia. In patients with COPD shortness of breath and difficulty exhaling has a permanent character, enhanced after exercise, the lack of reversibility of bronchial obstruction even after treatment, no eosinophils in the blood, sputum and bronchial washings, tests with allergens are negative, unlike asthma.

Tracheobronchial dyskinesia (expiratory stenosis of the trachea and the large bronchi) manifests painful paroxysmal, bitonal cough and difficulty exhaling. The attack is triggered by physical exertion cough, laugh, SARS. The cough associated with the weakness of the membranous portion of the trachea. In this case there is no evidence of allergic changes, no scattered dry rales in the lungs. The diagnosis is confirmed by bronchoscopy.

Often it is necessary to carry out the differential diagnosis of heart attack and bronchial asthma. When ***cardiac asthma*** should take into account the presence of shortness of breath at inhalation or mixed, cardiac history, the characteristic position of the patient (orthopnea), the absence of the allergic pulmonary manifestations, eosinophilia.

Treatment. According to international recommendations asthma management strategy includes:

- Control the course and progression of asthma exacerbations warning;
- Maximizing improving the quality of life;
- Prevent development of irreversible component of bronchial obstruction;
- Preventing mortality from the disease.

These goals can be achieved with the help of the program of action in the following areas:

- Education and training of patients;
- Evaluation and monitoring of disease severity;
- Prevent contact with trigger factors or attempt to control them;
- Creating a plan for continuous long-term asthma treatment
- Ensure regular monitoring of patients, asthma control, control of regularity and consistency of treatment..

Drug treatment of asthma is based on the use of two main types of medicines: long-term maintenance therapy (anti-inflammatories and long-acting bronchodilators) and the medicines to relieve attacks of breathlessness (short-acting bronchodilators). Drug-induced asthma therapy is conducted in various ways - by inhalation, orally, parenterally. The greatest advantage has the inhalation route of drug treatment, provides high local effects in the lungs, does not cause unwanted systemic effects makes it possible to speed up the effect of treatment, to reduce the effective dose of medication. Monitoring medicines are used daily for a long time, basically with constant asthma control. Preventive controlling asthma include anti-inflammatory drugs (most indicated - inhaled steroids) and β_2 -agonists. Despite the fact that asthma is a chronic disease in many patients it can be controlled and is defined as:

- Minimal (ideally there are no) chronic symptoms, including night;
- Minimal (infrequent) exacerbations
- No need to call an ambulance
- Minimal (ideally there are no) need for the use of short-acting β_2 -agonists as needed;
- No reduction of activity, including the physical;
- Circadian variability PEF < 20%;
- Close to the normal PEF indicators;
- Minimal (or there are no) therapy adverse effects.

Degree	<i>Asthma stepwise treatment regimen</i> Pharmacotherapy
1. Intermittent asthma	<ul style="list-style-type: none"> • Inhaled β_2-agonists, short-acting at the request of the presence of symptoms • Prophylactic administration of inhaled short-acting β_2-agonist before physical exertion or before the possible allergen influence.
2. Persistent mild	<ul style="list-style-type: none"> • Daily anti-inflammatory drugs medication on a regular basis • The benefits of inhaled glucocorticosteroids prescription in low daily doses (200 - 500 mcg of beclomethasone or budesonide per day or 50-100 mcg fluticasone a day) • In the case of partial control of the disease instead of increasing the dose of inhaled corticosteroids in addition it is necessary to prescribe a long-acting β_2-agonist (salmeterol). Benefits has the prescription of long-acting β_2-agonist and inhaled corticosteroids in a fixed combination in one dosage form (Seretide 50/100 mcg 2 times a day, Symbicort), which increases the effectiveness of therapy, reduces the side effects. • Less effective theophylline (requiring serum monitoring), cromones, leukotriene modifiers • If necessary - β_2-agonists, short-acting medication of necessity
3. Persistent moderate	<ul style="list-style-type: none"> • Daily anti-inflammatory drugs on a regular basis • Advantages has a combined inhaled corticosteroids and low doses of inhaled long-acting β_2-agonists (salmeterol, formoterol) in a separate delivery device, and in a fixed combination. (Seretide 50/250 mcg 2 times a day, Symbicort 1 inhalation 1 time a day) • An alternative to prolonged inhalation β_2-agonists may be prolonged theophylline (with control serum theophylline concentrations), oral β_2-agonists, leukotriene modifiers. However, these drugs are less effective than inhaled long-acting β_2-agonists, and the risk of side effects increases • Symptomatic treatment: If necessary, β_2-agonists, short-acting at the request of (first choice). Other bronchodilators: anticholinergics Inhaled short-acting oral β_2-agonists, short-acting theophylline have a slower onset of action and a greater risk of adverse events

4. Severe persistent asthma • The need for daily use two or more control medicines

- The benefits of a purpose medium-high doses of inhaled corticosteroids in combination with long-acting inhaled β_2 -agonist (salmeterol). More effective is the prescription of long-acting β_2 -agonist and inhaled corticosteroids in a fixed combination.
- Long-acting theophylline, leukotriene modifiers, or long-acting oral β_2 -agonists may be assigned additional
- In uncontrolled asthma oral glucocorticosteroids in the lowest to achieve an effect possible dose preferably 1 times a day, in the morning
- If necessary, β_2 -agonists short action of necessity.

Asthma exacerbations degrees

Symptoms	Mild	Moderate	Severe	Stop breathing threat
Dyspnea	During the walk can lie	When talking, difficulty eating mainly sit	At rest Forced position - bend forward	
Conversation	The sentence	The phrases	The words	-
Consciousness	Perhaps the excitement	Usually excited	Usually excited	Confusion
Breathing rate	Increased	Increased	More than 30 / min.	-
The participation of auxiliary muscles	Usually there is no	Usually present	Usually present	Paradoxical thoracoabdominal breathing
Wheezing	Moderate, usually at the end of exhalation	Loud	Of course loud	The absence of the whistle
Pulse / min.	< 100 %	100 - 120	>120	bradycardia
The paradoxical pulse	No <10 mm Hg	No 10 - 25 mm Hg	No > 25 mm Hg	Not when muscle fatigue
PEF after receiving bronchodilators, predict values% or the best for the patient	More than 80%	60 – 80 %	<60% (<100 L / min.) or a response continues <2 hours	
PaO ₂	Norm	> 60 mm Hg	< 60 mm Hg	-
PaCO ₂	< 45 mm Hg	< 45 mm Hg	> 45 mm Hg	-
SaO ₂	> 95 %	91 – 95 %	< 90 %	-

Treatment of asthma exacerbation
Outpatient

Exacerbation severity assessment

PEF <80% of personal best or proper for 2 consecutive days, or > 70% in the absence of a response to bronchodilator

Clinical symptoms: cough, shortness of breath, wheezing, chest stiffness, auxiliary muscles participation in the breath, suprasternal retraction.

Initial therapy - inhaled β_2 -agonists to 3 times per hour (every 20 minutes)

We recommend using metered inhaler dose with a spacer or bronchodilators solution through nebuliser

Good response <i>Mild exacerbation</i> If PEF > 80% of predicted or personal best The response to β_2 -agonists is maintained for 4 hours: - Continue inhaled β_2 -agonist every 3 - 4 hours for 24 - 48 hours	Incomplete response <i>Moderate exacerbation</i> If PEF 60 - 80% of predicted or personal best: - Add oral steroids - Continue receiving β_2 -agonists	Poor response <i>Severe exacerbation</i> If PEF < 60% of predicted or personal best: - Add oral steroids - Immediately repeat the reception of β_2 -agonists - Add anticholinergics - Consult a doctor, call "ambulance"
Treatment of asthma exacerbation <i>Hospital stage</i>		
The initial assessment of exacerbation severity: physical examination (auscultation, auxiliary muscles participation in the breath, HR, BR, PEF, FEV1, SaO ₂ , arterial blood gas measurements in extremely severe cases, other indicated studies		
The initial phase of treatment: - Inhaled β_2 -agonists, short-acting constantly for an hour through a nebulizer - Oxygen in SaO ₂ ≥ 90% - Systemic steroids, if not an immediate response to the treatment, a history of recent steroids, severe attack		
Reassessment after 1h .: physical examination, PEF, SaO ₂ , other indicated studies		
Moderate attack: - PEF 60 - 80% of proper / personal best - Physical examination: mild symptoms, auxiliary muscles participation - Recommended glucocorticosteroids - Inhaled β_2 -agonists, anticholinergics every hour for 3 hours - Continue treatment for 1 - 3 hours to improve.	Severe attack: - PEF < 60% of proper / personal best - Physical examination: severe symptoms at rest, chest retraction - Patients of high degree risk - There is no clinical improvement after initial treatment - Inhaled β_2 -agonists every hour + anticholinergics - Oxygen therapy - Systemic steroids - B ₂ -agonists IV, SC, IM - Recommended methylxanthines IV - Recommended Magnesia IV	
Good answer - A is maintained for 60 minutes after the last manipulation - Physical examination: without changes - PEF > 70% - No distress syndrome - SaO ₂ > 90% (95% in children)	Partial response within 1 - 2 hours - Patients at high risk - Physical examination: mild-moderate symptoms - PEF < 70% - SaO ₂ is not improving	Poor response within 1 hour - Patients at high risk - Physical examination: severe symptoms, confusion - PEF < 30% - PCO ₂ > 45 mm Hg. Art. - PO ₂ < 60 mmHg. Art.
Discharge from the hospital - Continue treatment with inhaled β_2 -agonists - oral CS are recommended in most cases, - Patient Education: - Correct drugs administration - View individual plan - Careful medical supervision	Referral to hospital - Inhaled β_2 -agonists+anticholinergics - Systemic corticosteroids - Oxygen therapy - Recommended methylxanthines IV - PEF, SaO ₂ , HR, theophylline serum concentrations monitoring	Referral to intensive care unit (ICU) - Inhaled β_2 -agonists+anticholinergics - Systemic corticosteroids IV - Recommended β_2 -agonists IV, SC, IM inhaled - Oxygen therapy - Recommended methylxanthines IV - Possible intubation and ventilation
improvement		No answer

Discharge from the hospital - PEF> 60% of predicted/ personal best - Continue oral / inhalation therapy	Referral to intensive care unit - If there is no response within 6 - 12 hours.
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The approach to the management of asthma based on the control

Step 1	Step2	Step 3	Step 4	Step 5
Asthma Training Environmental control				
β2-agonists short-acting if necessary				
Controlled therapy	Select one	Select one	Add one or more	Add one or both
	Low-dose inhaled corticosteroids	Low doses of inhaled corticosteroids + β2-agonists long-acting	ICS in the middle and high doses or + β2-agonists long-acting	Oral steroids (the minimum possible dose)
	Leukotriene modifiers	ICS in the middle and high doses or	Leukotriene modifiers	Antibodies to IgE
		Low-dose ICS + theophylline sustained release	Theophylline sustained release	

Prevention

Primary: avoid exposure to allergens, balanced diet, chronic infection foci timely readjustment, active lifestyle, hardening, physical education and sports. Identification of family history, the prevention of intrauterine sensitization, allergen sensitization postnatally coming in breast milk, other food, from the environment; promoting the maturation of the immune system,., reducing the influence of nonspecific factors to a minimum.

Materials for self-control:

Situational tasks:

1. Patient D., 43, at admitted to the hospital with complaints of asthma attacks, especially at night, the presence of distant wheezes. The history of ill chronic bronchitis. Over the past year began to bother asthma attacks. Blood test: WBC- $9.0 \times 10^9/L$; ESR- 20 mm / h.

What is the preliminary diagnosis? What additional tests are necessary?

2. Patient K., 32g., Admitted to the hospital with complaints of asthma attacks 3-4 times a day, can not be removed salbutamol, shortness of breath on exertion, dry hacking cough. OBJECTIVE: percussion box sound, hard breathing on auscultation scattered dry rales.

What is the preliminary diagnosis? What additional tests are necessary to the patient? The treatment plan?

Tests:

1. In accordance with the recommendations of the WHO daily dose of inhaled corticosteroids in persistent mild asthma in adults is

- A. 150-300 mcg
- B. 200-500 mcg
- C. 800-2000 mcg
- D. More than 2000 mcg?

2. The patient was diagnosed "Bronchial asthma, persistent moderate." What preparation do you prefer for the planned treatment of disease?

- A. Intal
- B. Bekotid-Mitte

- C. Budesonide forte
- D. Salbutamol
- E. Berotek

3. The patient complains of constant attacks of breathlessness, which often occur at night, physical activity is significantly limited because of respiratory discomfort. Peak expiratory flow volume <60% of the predicted, daily variations in PEF > 30%. What is the likely diagnosis in this patient?

- A. Chronic obstructive bronchitis exacerbation
- B. Intermittent asthma
- C. Mild persistent asthma
- D. Moderate persistent asthma
- E. Severe persistent asthma

4. A patient with mild persistent bronchial asthma exacerbation occurred. Your recommendations?

- A. Increase the dose of beta-2-agonist short-acting, without increasing the dose of inhaled corticosteroids.
- B. Conduct a test with bronchodilator, and then increase the dose of inhaled corticosteroids and beta-2-agonist.
- C. Carry out a provocative test with histamine, and then increase the dose of inhaled corticosteroids and beta-2-agonist.
- D. Increase the dose of inhaled corticosteroids, beta-2-agonist, and then spend a provocative test with histamine.
- E. Increase the dose of inhaled corticosteroids, beta-2-agonists of short action.

5. Patient of 35 years has rare (less than 1 time per week) asthma attacks, which can be easily removed with inhaled beta2-sympathomimetics short-acting. During the attack dry wheezing in the lungs auscultated, between the bouts of breathlessness FEV1 more than 80% of predicted. In this patient:

- A. Intermittent asthma.
- B. Mild persistent asthma
- C. Moderate severity persistent asthma
- D. Severe persistent asthma
- E. This information is insufficient to determine the severity of asthma

6. Patient of years complains of asthma attacks, currently treated 1-2 doses of salbutamol. End of episode is accompanied by cough with discharge of a small amount of viscous glassy phlegm. Sick 8 years. In history - acute urticaria. Objectively: temperature - 36,7°; RR - 21 / min .; pulse 90 / min.; BP- 130/80 mm Hg. FEV1 - 77%. Over the lungs - a small number of wheezes. Blood test: HB - 120 g /L; RBC - 4.7×10^{12} / L; WBC - 7.9×10^9 / L; band - 6%; eos. - 6%; s/n - 60%; lymph - 24%; m - 4%; ESR - 12 mm / hour. What preparations are "basic" in the treatment of disease of the patient?

- A. Anticholinergics.
- B. Mucolytics
- C. Anti-inflammatory drugs
- D. Antihistamines.
- E. β 2-agonists.

7. The patient has severe asthma attack lasts more than 1 hour, despite the use of beta-agonists by inhalation and intravenous aminophylline and anticholinergics. What medicines nebhodimo supplement emergency treatment?

- A. Beta-blockers intravenously
- B. ICS
- C. Antigistaminni mullions
- D. Corticosteroids intravenously
- E. NSAIDs

Correct answers to the situational tasks:

1.
 - 1) Bronchial asthma, persistent moderate severity.
 - 2) Chest X-ray, spirometry, sputum analysis.
2.
 - 1) Bronchial asthma, persistent moderate severity.
 - 2) Chest X-ray, spirometry, sputum analysis.
 - 3) Seretide 250 micrograms twice daily.

The answers to the tests:

1-B, 2-B, E-3, E-4, A-5, A-6, A-7.

Recommended literature

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4. Global strategy for asthma management and prevention (GINA 2016).- http://www.ginasthma.org/pdf/GINA_Report_2016.pdf.