

VI. MEDICATIONS WITH ACTION ON THE EFFECTOR ORGANS FUNCTIONS

PREPARATIONS WITH ACTION ON THE RESPIRATORY SYSTEM

A. Actuality. According to WHO statistics, diseases of the respiratory system are found in every 3-4 patients who go to the doctor. The treatment of acute and chronic diseases of the respiratory system occupies an important place in medical practice and involves the use of drugs from different pharmacological groups (bronchodilators, expectorants, mucolytics, antitussive, antiallergic, etc.).

B. Purpose of training. Familiarization of students with the pharmacological properties of the preparations used in the diseases of the respiratory system.

C. Didactic objectives

1) The student **must know**: classification, mechanism of action, effects, indications, contraindications and adverse reactions of preparations that stimulate breathing, antitussives, expectorants, used in broncho-obstructive diseases and pulmonary edema.

2) The student **must be able to**: prescribe in all medicinal forms the mandatory drugs from this group and indicate them in the respective diseases and pathological conditions.

D. Knowledge of previous and related disciplines necessary for interdisciplinary integration.

Physiology. Nervous and humoral mechanisms of respiratory regulation. Nervous and humoral control of bronchial tone. Control of pulmonary circulation.

Pathophysiology. Pathogenic chain of restrictive and obstructive external respiratory disorders, diffusion disorders and gas transport.

Semiology - internal medicine. Concept of suffocation, obstructive pulmonary diseases (bronchial asthma, chronic obstructive pulmonary disease, bronchiectasis), pulmonary edema, pulmonary hypertension.

E. Questions for self-training:

1. Medicines used in diseases of the respiratory system.

2. Antitussives. Definition and classification.

3. Opioid antitussives: mechanism of action, indications, contraindications and side effects.

4. Centrally acting non-opioid antitussives: mechanism of action, indications, contraindications and side effects.

5. H1-antihistamines used as antitussives: mechanisms of action, indications

6. Antitussives with peripheral action. Classification. Antitussives with specific action: the mechanism of action, indications, adverse reactions.

7. Expectorants. Classification.

8. Secretostimulants with reflex action: mechanisms of expectorant action, indications, contraindications and adverse reactions.

9. Secretostimulants with direct or mixed action: classification, mechanism of action, indications, contraindications and adverse reactions.

10. Secretolytics (mucolytics): classification, mechanism and peculiarities of action of bromhexine, acetylcysteine, proteolytic enzymes. Indications, contraindications and adverse reactions.

11. Classification of drugs used in broncho-obstructive diseases.

12. Bronchodilators. Classification.

13. Adrenomimetics: classification. Beta-2-adrenomimetics: classification by duration of action, mechanism of action, effects, indications, side effects.

14. M-cholinoblockers: classification according to duration of action, effects, indications, side effects.

15. Glucocorticoids: classification by route of administration, effects, indications, side effects of inhaled glucocorticoids.

16. Methylxanthines as bronchodilators: classification, mechanisms of action, effects, indications, side effects.

17. Mast cell stabilizers and leukotriene antagonists: effects, indications, contraindications and side effects.

18. Antileukotrienes: pharmacodynamics, indications.

19. Respiratory center stimulants. Classification. Mechanism of action. Comparative characteristics of centrally and peripherally acting respiratory stimulators. Indications, contraindications and adverse reactions.

20. Groups of preparations used in the treatment of pulmonary edema.

21. Surfactant preparations: properties, indications.

F. Individual works for the student's self-training (points 1, 2, 3 and 4 are obligatory and are made in writing during the training process)

1) To prescribe the following drugs in all medicinal forms:

1. Niketamide. 2. Epinephrine. 3. Ipratropium bromide. 4. Aminophylline. 5. Salbutamol. 6. Disodium cromoglycate. 7. Codeine. 8. Ketotifen. 9. Ambroxol. 10. Butamirate. 11. Bromhexine. 12. Acetylcysteine. 13. Dextromethorphan. 14. Prenoxdiazine.

<i>Nr.</i>	<i>Medicine ' name</i>	<i>Medicinal forms, doses</i>
1.	Niketamide	Sol. 1 ml; 2ml in amp. (i/v or s/c) Sol. 30 ml in vials (internal)
2.	Epinephrine	Sol. 0,1% - 1ml in amp. Sol. 0,1% - 10ml in vials
3.	Ipratropium bromide	Sol. 0,02% - 2,5ml in vials (inhalatory) Aerosol 15ml
4.	Aminophylline	Tabl. 0,15 Sol. 2,4% - 5ml și 10ml in amp.
5.	Salbutamol	Sol. 0,1% - 5ml in amp. (i/v) Sol. 0,1% - 50ml in vials (inhalatory) Tabl. 0,002; 0,004 Syrup 0,04% - 60ml Aerosol 15ml și 20ml
6.	Disodium cromoglycate	Caps. 0,1 (internaly) ; 0,02 (inhalatory) Sol. 1% - 2ml in amp. (inhalatory) Aerosol 10ml și 15ml
7.	Codeine	Tabl. 0,015

8.	Ketotifen	Tabl. / Caps. 0,001 Syrup 0,02% - 100ml in vials
9.	Ambroxol	Tabl. 0,03 Syrup 100 ml in vials Sol. 0,2%-2 ml in amp. (i/v)
10.	Butamirate	Syrup 0,15%-200ml in vials Tabl. 0,05
11.	Bromhexine	Tabl. / Dragee 0,004; 0,008 Sol. 60ml in vials (internaly)
12.	Acetylcysteine	Tabl. 0,2; 0,6 (effervescent) (internally) Caps. 0,2; 0,6 (internally) Granules 0,2; 0,6 in sacches Sol. 10% - 3ml in amp. (i/v sau inhalatory)
13.	Dextrometorphan	Tabl. / Caps. 0,01; 0,015 Syrup 100ml in vials
14.	Prenoxdiazine	Tabl. 0,1

2) List the groups and drugs used in (for): newborns asphyxia; dry cough in acute respiratory infections; pertussis; cough in inoperable cancer; secretostimulants in acute respiratory infections; secretostimulants in broncho-obstructive diseases; secretolytic in broncho-obstructive diseases; secretolytics in bronchopneumonia; cystic fibrosis; bronchodilators in broncho-obstructive diseases; asthma attacks; prophylaxis of bronchospasm when inhaling drugs; anti-inflammatory, anti-allergic and bronchodilator preparations in broncho-obstructive diseases; combined medicines in broncho-obstructive diseases; status asthmatic; paracetamol poisoning; antifoam preparations in pulmonary edema; pulmonary edema; respiratory distress syndrome.

3) Tables (knowledge consolidation)

Table 1

Characteristics of secretion stimulants and secretolytics used in respiratory diseases

Medicinal groups	Medicines	Mechanism of action	Indications
Secretostimulants with reflex action			
Secretostimulants with direct and mixed action			
Secretolytics, proteolytic enzymes			
Secretolytic, thiol derivatives			
Secretolytic, vascine derivatives			

Table 2

Characteristics of bronchodilators used in broncho-obstructive diseases

Pharmacological parameters	Beta-2 - AM	M – CB	Methylxanthines
Short duration			
Long duration			
Ultralong duration			
Mechanism of			

bronchodilator action			
Predominant relaxation of the caliber bronchi			
Bronchial secretion			
Mucociliary transport			
Release of mediators from mast cells			

Table 3

Characteristics of preparations used in broncho-obstructive diseases (COPD, bronchial asthma)

Medicinal groups	Asthma attacks (route of administration)	Status asthmatic (route of administration)	Prevention of asthma attacks (route of administration)	Basic treatment of broncho-obstructive diseases (route of administration)
Beta-2-adrenomimetics				
M-cholinoblockers				
Systemic glucocorticoids				
Inhalatory glucocorticoids				
Methylxantines				
Mast cell stabilizers				
Leucotriene receptors blockers				

4) Problem of situation

A patient with irritating and harrowing tinnitus was prescribed an antitussive tablet. For faster installation of the effect, the patient chewed the tablet and swallowed it. But from the moment of using the tablet, the patient felt a numbness in the oral cavity.

What medicine did he use?

About what particularities of drug administration was it necessary to explain to the patient in order to avoid the complication of the appearance?

5) Tests for self-training (Guide for laboratory work in pharmacology. Chisinau 2016, page 158 - 162)

G. Interactive activity

1. Experimental and virtual didactic movie (conclusions)

2. Clinical cases (Guide for laboratory works in pharmacology. Chisinau 2016, page 162).

3. Virtual situations (Guide for laboratory works in pharmacology. Chisinau 2016, page 163 - 164).