Drugs with Action on Respiratory System Functions

A. **Actuality.** According to WHO statistics, respiratory system disorders are found in one out of every 3-4 patients seeking medical care. The treatment of acute and chronic respiratory diseases plays an important role in medical practice and involves the use of medications from various pharmacological groups (bronchodilators, expectorants, mucolytics, antitussives, antiallergics, etc.).

B. **Purpose of training:**To familiarize students with the pharmacological properties of the drugs used in respiratory system disorders.

C. **Didactic purposes.**

1. The student must know: classification, mechanism of action, effects, indications, contraindications, and adverse reactions of antitussive, expectorant, mucolytic, bronchodilator preparations, and medications used in pulmonary edema.
2. The student must be able to: prescribe medications in all dosage forms for the mandatory drugs in this group and indicate them in the respective diseases and pathological conditions.

D. **Knowledge from previous and related disciplines necessary for interdisciplinary integration.**

Human Physiology: The autonomic respiratory center. Neurohumoral influences on the respiratory center. The role of vascular chemoreceptors in regulating breathing.

Pathophysiology: Main causes of respiratory failure. Bronchial obstruction mechanisms.

Semiology of Internal Diseases: Concepts of asphyxia, bronchial obstruction, bronchospasm. Cough classification and characteristics. Bronchial asthma. Symptoms of bronchial asthma.

E. Questions for self-training:

1. Antitussives: Definition and classification.
2. Opioid antitussives: Mechanism of action, indications, contraindications, and adverse reactions.
3. Non-opioid central acting antitussives: Mechanism of action, indications, contraindications, and adverse reactions.
4. Peripherally acting antitussives: Classification.
5. Specific action antitussives: Mechanism of action, indications, adverse reactions.
6. Expectorants: Classification.
7. Reflex action secretostimulants: Mechanisms of expectorant action, indications, contraindications, and adverse reactions.
8. Direct or mixed action secretostimulants: Classification, mechanism of action, indications, contraindications, and adverse reactions.
9. Secretolytics (mucolytics): Classification, mechanism, and characteristics of bromhexine, acetylcysteine, and proteolytic enzymes. Indications, contraindications, and adverse reactions.
10. Classification of drugs used in bronchial asthma (anti-asthmatics).
11. Bronchodilators: Classification.

12. M-cholinoblockers: Classification by duration of action, effects in bronchial asthma, indications, adverse reactions.
13. Glucocorticoids: Classification by administration method, effects in bronchial asthma, indications, adverse reactions of inhaled glucocorticoids.
14. Adrenomimetics: Classification by group membership and duration of action, mechanism of action, effects in bronchial asthma, indications, adverse reactions.
15. Mast cell degranulation inhibitors and leukotriene antagonists: Effects, indications, contraindications, and adverse reactions.
16. Respiratory stimulants: Classification. Mechanism of action. Comparative characteristics of respiratory stimulants from the analeptic and N-cholinomimetic groups. Particularities of etimizole. Indications, contraindications, and adverse reactions.
17. Drug groups used in pulmonary edema treatment.

F. **Student's individual work** (is made in writing during the training process)

1) Medical prescription exercises

To prescribe the following drugs in all forms of delivery: 1. Niketamide. 2. Epinephrine. 3. Ipratropium bromide. 4. Aminophylline. 5. Salbutamol. 6. Sodium cromoglycate. 7. Codeine. 8. Ketotifen. 9. Etimizole. 10. Prenoxdiazine. 11. Bromhexine. 12. Acetylcysteine. 13. Dextromethorphan.

No.	***Drug Name***	***Medicinal forms, dosage***
1	Niketamide	Sol. 1ml; 2ml vials, Sol. 15ml; 30ml bottles (oral use)
2	Epinephrine	Sol. 0.1% - 1ml vials, Sol. 0.1% - 10ml bottles
3	Ipratropium Bromide	Sol. 0.025% - 20ml bottles (for inhalations), Aerosol 15ml
4	Aminophylline	Tablets 0.15, Sol. 2.4% - 5ml; 10ml vials
5	Salbutamol	Sol. 0.1% - 5ml vials, Sol. 0.1% - 50ml bottles, Tablets 0.002; 0.004, Syrup 0.04% - 60ml, Aerosol 15ml; 20ml
6	Sodium Cromoglycate	Eye drops 4% - 5ml; 10ml, Capsules 0.1, Sol. 1% - 2ml vials (for inhalations), Aerosol 10ml; 15ml
7	Codeine	Tablets 0.015
8	Ketotifen	Tablets / Capsules 0.001, Syrup 0.02% - 100ml bottles
9	Etimizole	Tablets 0.1, Sol. 1% - 3ml; 5ml vials
10	Prenoxdiazine	Tablets 0.1
11	Bromhexine	Tablets / Dragees 0.004; 0.008, Sol. 0.2% - 2ml vials, Syrup 60ml; 100ml (0.004/5ml) bottles
12	Acetylcysteine	Tablets / Capsules 0.1; 0.2; 0.6, Granules 0.2; 0.6 in packets, Sol. 20% - 5ml vials (for inhalations), Sol. 10% - 3ml vials (parenteral)
13	Dextromethorphan	Tablets / Capsules 0.01; 0.015, Syrup 100ml (0.015/5ml) bottles

2.**List the drug groups and medications used for**: Newborn asphyxia, dry cough, pulmonary edema, acute respiratory infections, chronic bronchitis, bronchopneumonia, asthma attacks, systemic (maintenance) treatment of bronchial asthma, chronic obstructive pulmonary disease, asthmatic status (status asthmaticus)

G. **Individual Work for Knowledge Consolidation**

1. **Tests** (Guide for laboratory work in pharmacology. Chisinau 2016, pp. 158-162).
2. **Tables** (Review of knowledge)

Table 1:

3. **Characteristics of Drugs Used in Bronchial Asthma**

Pharmacological Group	**Medications**	**Route of Administration**	**Mechanism of Action**	**Indications (prevention or management of attacks)**
Beta-adrenomimetics	...	...	...	...
M-cholinoblockers	...	...	...	...
Musculotropic Spasmolytics (Methylxanthines)	...	...	...	...
Glucocorticosteroids	...	...	...	...
Mast cell degranulation inhibitors	...	...	...	...
H1-histamine receptor blockers	...	...	...	...

H. **Interactive Activities**

1. Educational experimental and virtual film (preparing minutes and conclusions)
2. Clinical cases (Guide for laboratory work in pharmacology. Chisinau 2016, p. 162)
3. Virtual situations (Guide for laboratory work in pharmacology. Chisinau 2016, pp. 163-164)
4. Situational problem
   A patient with an irritating and painful cough was prescribed an antitussive medication in tablet form. To achieve a faster effect, the patient chewed the tablet before swallowing. However, upon using the tablet, the patient felt numbness in the oral cavity.
   What medication did the patient use?

What specific features of the medication should have been explained to the patient to avoid the complication?