

## DRUGS INFLUENCING THE FUNCTIONS OF RESPIRATORY SYSTEM

**A. Actuality.** According to WHO statistics, every 3<sup>rd</sup> - 4<sup>th</sup> patient who visits the doctor has a respiratory disease. That's why the treatment of many acute and chronic respiratory diseases has an important role in ambulatory and clinical practice. Medicinal treatment of various pathological states of respiratory organs is complex and needs usage of drugs from different pharmacological groups (spasmolytics, cardiovascular, antiinflammatory, antiallergic etc.).

**B. The purpose of training is** to acquire basic knowledge in the domain of treatment of the most widespread diseases of the respiratory system, to know drugs used in medical emergency assistance - removal of bronchial asthma, different forms of asphyxias, pulmonary edema, pulmonary hemorrhages.

### **C. Learning objectives:**

- a) The students must **know:** the definition, classification, mechanism of action of anticough, expectorants, mucolytic drugs, bronchodilators and drugs used for bronchial asthma, pulmonary edema and asphyxia.
- b) The students must **be able to:** prescribe all compulsory drugs of this group in all medicinal forms.

### **D. Initial level of knowledge required for interdisciplinary integration:**

**Human physiology.** Automatism of respiratory center. Neurohumoral influence on respiratory center. The importance of vascular chemoreceptors in regulation of respiration.

**Physiopathology.** Main causes of respiratory insufficiency. Obturation of bronchi, mechanism.

**Internal diseases.** Notion of asphyxia, bronchial obstruction, bronchospasm. Classification and characteristics of cough. Bronchial asthma. Symptoms of bronchial asthma and asthmatic bronchitis.

### **E. Self - training questions:**

1. Respiratory analeptic drugs. Classification. Mechanism of action. Comparative characteristics of respiratory stimulants from the group of analeptics and N-cholinomimetics. Peculiarities of ethimizol. Distinction in duration of action. Ways of administration. Indications and contraindications. Side effects.
2. Anticough drugs. Definition and classification:
  - a) Opioid anticough drugs: mechanism of action, indications, contraindications and adverse reactions.
  - b) Nonopioid anticough drugs: mechanism of action, indications, contraindications and adverse reactions.
  - c) Anticough drugs with peripheral action. Classification. Antitussives with specific action : mechanism of action, indications, adverse reactions.
3. Expectorant drugs. Classification. Secretostimulating drugs with reflex action. Mechanism of action, indications, contraindications and side effects. Secretostimulating drugs with direct and mixed action. Classification, mechanism of action, indications, contraindications and side effects.

4. Secretolitics (mucolytics). Classification, mechanism and peculiarities of action of bromhexine, acetylcysteine, proteolytic enzymes. Indications, contraindications and side effects.
5. Classification of drugs used in bronchial asthma (antiasthmatic):
  - a)
  - b) Glucocorticoids: classification by rout of administration, effects in asthma, indications, adverse reactions of inhaled GCs.
  - c) Adrenomimetics: classification according to the duration of the action; mechanism of action, effects in asthma, indications, adverse reactions.
6. Bronchodilators. Classification.
7. M-cholinoblocks: classification by duration of action, pharmacological effects in asthma, indications, adverse reactions.
8. Glucocorticoids: classification by rout of administration, effects in asthma, indications, adverse reactions of inhaled GCs.
9. Adrenomimetics: classification according to the duration of the action; mechanism of action, effects in asthma, indications, adverse reactions.
10. Mast cell stabilizers and inhibitors of leukotriene receptors. Indications, contraindications and side effects.
11. Groups of drugs used in pulmonary edema.

**F. Independent work** (is done in written form while preparing for the lesson):

**1) Brief characteristics of compulsory drugs.**

**Down.** Drug name: 1. Nikethamide. 2. Cytiton. 3. Epinephrine. 4. Ipratropium bromide. 5. Aminophylline. 6. Salbutamol. 7. Sodium cromoglycate. 8. Codeine. 9. Ketotifen. 10. Ethimizol. 11. Prenoxdiazine. 12. Bromhexine. 13. Dextromethorphan. 14. Acetylcysteine. 15. Sodium benzoate.

**Across:** 1. Medicinal form. 2. Way of administration. 3. Doses (therapeutic, maximum for one intake and for 24 hours). 4. Mechanism of action. 5. Indications and contraindications. 6. Side effects.

**2) Questions on medical prescriptions.**

**To prescribe** the following drugs in all possible medicinal forms: 1. Nikethamide. 2. Cytiton. 3. Epinephrine. 4. Ipratropium bromide. 5. Aminophylline. 6. Salbutamol. 7. Sodium cromoglycate. 8. Codeine. 9. Ketotifen. 10. Ethimizol. 11. Prenoxdiazine. 12. Bromhexine. 13. Acetylcysteine. 14. Sodium benzoate. 15. Dextromethorphan.

**Drugs used in (for):** newborn's asphyxia, dry cough, pulmonary edema, acute respiratory infection, chronic bronchitis, bronchopneumonia, acces of bronchial asthma, treatment of bronchial asthma, chronic obstructive bronhopneumopathy, status asthmaticus.

3) **Tests** (Guidelines for Laboratory Work in Pharmacology).

4) **Clinical case** (Guidelines for Laboratory Work in Pharmacology).

5) **Virtual situations** (Guidelines for Laboratory Work in Pharmacology).  
"Respiratory Pharmacology".

6) **Virtual didactic movie.**

7) **Tables**

**Table N1****Characteristics of drugs used in bronchial asthma**

| <b>Pharmacological group</b>                   | <b>Drugs</b> | <b>Way of administration</b> | <b>Mechanism of action</b> | <b>Indication/contraindication</b> |
|--|--------------|------------------------------|----------------------------|------------------------------------|
| <b>Beta-adrenomimetics</b>                     |              |                              |                            |                                    |
| <b>M-cholinoblockers</b>                       |              |                              |                            |                                    |
| <b>Myotropic spasmolytics (methylxanthine)</b> |              |                              |                            |                                    |
| <b>Mast cell membrane stabilizers</b>          |              |                              |                            |                                    |
| <b>H1-histaminoblocker</b>                     |              |                              |                            |                                    |

**8) Solve the case:**

A patient with irritating and painful cough was given an anticough drug in tablets. For quicker onset of the effect, the patient, by himself, mixed and swallowed it. From the moment he used the drug, he started to feel numbness in his oral cavity (mouth).

Which medication did the patient use?

What are the drug particularities that were needed to be explained to the patient in order to avoid any complications?