

# Pharmacology in pre-hospital emergency care/SŠ (nurse)

## Analgesics

*Morphine 1% inj. salt á 1 ml (10 mg in 1 ml)*

- Effects: suppresses pain, psychomotor depression, relaxation, euphoria, suppresses the respiratory center, vasodilation.
- Indications: severe injuries, burns, heart failure , pulmonary edema .
- Dosage:
  - for newborns and children up to 6 months of age iv bolus 25–50 µg/kg;
  - children aged 6–12 months are administered subcutaneously or intramuscularly at 0.2 mg/kg;
  - children aged 1–6 years dose 2–4 mg;
  - children aged 6–15 years 4–10 mg subcutaneously or intramuscularly;
  - adults 10–20 mg im, sc, iv dose is reduced by 1/3 to 1/2.
- Contraindications: hypersensitivity, impaired lung function with depression of the respiratory center, COPD , paralytic ileus and head injuries with increased intracranial pressure.
- It is incompatible with Aminofylline, heparin and Thiopental, so it must not be mixed in one syringe.
- Adverse effects: nausea , vomiting and constipation, depression of breathing, drowsiness and confusion, drop in blood pressure, dizziness, bradycardia, tachycardia, palpitations, hypothermia, allergic reactions at the injection site (pruritus, urticaria) and general (bronchoconstriction). At a higher dosage, significant respiratory depression may occur. In patients with bronchial asthma, morphine may induce bronchospasm. Watch out for the emergence of psychological and physical dependence.
- ANTIDOTE: NALOXONE.

*Fentanyl 50 µg/ml, amp. á 2 ml*

- Effects: relieves pain, can also be used as an anesthetic, suppresses breathing, bradycardia.
- Indications: anesthesia, analgesia in acute coronary syndrome , trauma, burns.
- Dosage for analgesia:
  - children from 2 to 12 years, analgesic dose 1–3 µg/kg IV slowly (approx. 1–2 min);
  - adults analgesic dose 50–100 µg iv
- Contraindications: hypersensitivity, simultaneous administration of MAO inhibitors, diseases with increased intracranial pressure, brain trauma, hypovolemia and hypotension.
- Adverse effects: respiratory depression up to apnoea, vertigo, euphoria, nausea and vomiting, convulsions, bradycardia up to cardiac arrest, hypotension, increased skeletal muscle tension (muscle rigidity), development of drug addiction.
- ANTIDOTE: NALOXONE.

*Tramal inj. 50 mg/1 ml, amp. 1 or 2 ml; Tramal á 50 mg/1 tbl.*

- Effects: opioid analgesic with antitussive effect, minimal effect on the respiratory center and gastrointestinal motility.
- Indications: moderate to severe pain.
- Methods of administration: intravenous, intramuscular, subcutaneous, per os.
- Dosage:
  - children from 1 year of age – a single analgesic dose of 1–2 mg/kg of body weight, but a maximum of 400 mg/day;
  - adults and adolescents from 12 years of age 50–100 mg every 4–6 hours, but a maximum of 400 mg/day, except in cases of extraordinary clinical situations.
- Contraindications: acute intoxication with alcohol, hypnotics , analgesics , opioids or other psychotropic medicinal products, epilepsy that is not sufficiently controlled by treatment, in the substitution treatment of drug addiction.
- Adverse effects: nausea, dizziness, convulsions, constipation, sweating, rarely depression of breathing, dyspnoea, rise in blood pressure.
- ANTIDOTE: NALOXONE.

*Veral 75 mg/3 ml (ex. Dolmina inj.)*

- Effects: non-steroidal antirheumatic drug with anti-inflammatory, analgesic and antipyretic effects.
- Indications: acute pain of inflammatory and degenerative rheumatic diseases, biliary and renal colic , severe migraine attacks , acute attack of gout .
- Dosage: 1 amp. daily (75 mg), by deep intramuscular injection.

!!! It must not be administered in bolus form.

- Contraindications: not recommended for use in children and adolescents, in case of hypersensitivity to diclofenac. Acute gastrointestinal bleeding, severe heart failure, impaired kidney or liver function, 3rd trimester of pregnancy.
- Adverse effects: peptic ulcers , perforation or gastrointestinal bleeding.

## Anesthetics

*Calypsol inj 500mg/10ml (ketamine)*

- Effects: short-acting dissociative general anesthetic. It is advisable to simultaneously administer a benzodiazepine to suppress side effects (hallucinations, psychomotor restlessness).
- Indications: painful therapeutic and diagnostic procedures, bandages, burns, surgical procedures within 15 minutes, introduction to general anesthesia, persistent hiccups.
- Administer iv, im, alternatively buccally or intranasally;
- Dosage:
  - dosage according to the patient's response. Diazepam premedication is recommended. Anesthesia can be maintained by repeated administration of Calypsol in the amount of half of the entire initial dose, a maximum of 5 times.
    - initial iv dose for general anesthesia 1–4.5 mg/kg;
    - children 0.5–4.5 mg/kg;
    - average dose for anesthesia lasting 5–10 min. is 2 mg/kg;
    - for introduction to general anesthesia in adults, 6.5–13 mg/kg induces anesthesia lasting 12–25 min;
    - for introduction to general anesthesia in children 2–5 mg/kg;
    - Analgesia 4 mg/kg.
  - In the case of alternative administration, the dose is twice that of iv This is used in disaster medicine and selectively also in children.
- Contraindications: hypersensitivity to any substance contained in the preparation, glaucoma, preeclampsia or eclampsia, convulsions in history, schizophrenia, acute psychosis.
- Adverse effects: malignant hyperthermia, hypotension, tachycardia and bradycardia, respiratory depression - apnea, laryngospasm, mood changes, delirium, vivid dreams or delusional states, visual hallucinations, irrational behavior.

*Propofol 200 mg/20 ml amp. (Diprivan)*

- Effects: short-acting general anesthetic.
- Indications: introduction and maintenance of general anesthesia, sedation for UPV during resuscitation care, sedation during diagnostic and operative procedures.
- Dosage and use:
  - not recommended for general anesthesia in children younger than 1 month;
  - necessary monitoring of vital signs;
  - dosage individual, depends on the patient's response.
    - In the introduction to anesthesia, the dose is titrated (approximately 20–40 mg/10 seconds), until clinical signs of the onset of anesthesia → in most patients, a dose of 1.5–2.5 mg/kg is usually required.
      - Anesthesia can be maintained by continuous infusion or repeated bolus doses. For less demanding performances, a dose of 4 mg/kg/hour may be sufficient.
    - During sedation during surgical and diagnostic procedures 0.5–1 mg/kg/1–5 min. to start sedation.
- Contraindications: patients with known hypersensitivity to any component of the product, soy, nuts, age below 16 years, severe myocardial disease.
- Side effects: spontaneous. movements, hypotension, bradycardia, tachycardia, respiratory depression, hyperventilation, transient apnea, local pain at the injection site.

*Thiopental inj. á 500 mg* Barbiturate anesthetic.

- Indications: general anesthesia, management of convulsions in tetanus , eclampsia , epilepsy , overdose and toxic reaction to local anesthetics.
- Dosage:
  - to introduce general anesthesia, a dose is administered after which the lid reflex disappears, most often 4 mg/kg iv;
  - a dose of 250–500 mg is not exceeded;
  - the highest single dose is 1 g, the highest daily dose is 2 g.

!!! It must not be mixed with other medicines in the syringe.

- Contraindications: allergy, congestive heart failure, bronchial asthma , all severe septic conditions,

- hypotension, shock , severe liver or kidney damage, inability to ensure airway patency, severe anemia .
- Adverse effects: arrhythmia , respiratory depression up to apnea, shock state , laryngospasm easily occurs during painful irritation and in shallow anesthesia, asthma attack, paravenous administration leads to irritation up to subcutaneous necrosis, exanthema, pain at the injection site, "post-barbiturate hangover".

*Mesocaine inj. 1% salt 10 ml amp., Xylocaine spray* Local anesthetic

- Indications: topical, infiltration, local, superficial mucosal and inhalation, spinal anesthesia (intraosseous approaches).
- Contraindications: hypersensitivity to amide anesthetics, history of malignant hyperthermia, porphyria, hypovolemia, hypotension, cardiac conduction disorders, asystole, cardiogenic shock.
- Adverse effects: anaphylactic shock, skin and mucosal manifestations, drowsiness, hyporeflexia, coma, breathing disorders up to apnea, often accompanied by convulsions.

!!!It is not recommended as an antiarrhythmic in conditions of PNP.

## Antiaggregation

*Kardegic inj. á 0.5 g amp. + solvent .*

- Anticoagulant, antiaggregant based on acetylsalicylic acid.
- Indication: acute coronary syndrome .
- Dosage:
  - 1 bottle corresponds to 500 mg of acetylsalicylic acid, diluted in 5 ml of water for injection just before use and applied within 1–3 min.
- Contraindications: active gastroduodenal ulcer disease , hypersensitivity to salicylates and substances with a similar effect, especially non-steroidal anti-inflammatory drugs, congenital or acquired hemocoagulation disorders, dose above 100 mg/day in the 3rd trimester of pregnancy.
- Adverse effects: bronchospasm, anaphylactic reaction , increased bleeding, local reactions, in case of overdose, metabolic acidosis .

*Trombex 75 mg/tbl (Plavix)*

- Effect: inhibits platelet aggregation.
- Indications: acute coronary syndrome , ischemic CMP , after stent implantation.
- Dosage:
  - In the acute phase, therapy begins with an initial dose of 300 mg (4 tablets), in our case 600 mg, and then 75 mg/day.
- Contraindications: hypersensitivity to any substance contained in this preparation, severe liver dysfunction, active pathological bleeding such as peptic ulcer bleeding.
- Adverse effects: the most common are manifestations of hemorrhage.

*Anopyrin 400 mg/tbl.*

- Effects: analgesic, antipyretic, anticoagulant and antiaggregation effects.
- Indications: pain of mild and moderate intensity, febrile conditions, acute coronary syndrome.
- Dosage:
  - 400–800 mg of ASA in a single dose, it is possible to repeat after 4–8 hours;
  - the maximum dose is 4g/day.
- Contraindications: active gastroduodenal ulcer disease , hypersensitivity to salicylates and substances with a similar effect, especially non-steroidal anti-inflammatory drugs, congenital or acquired hemocoagulation disorders , dose above 100 mg/day in the 3rd trimester of pregnancy. Age up to 16 years.
- Adverse effects: bronchospasm, anaphylactic reaction, increased bleeding, metabolic acidosis in overdose. Development of Reye's syndrome in children .

## Antiarrhythmics

*Atropine inj. á 0.5 mg/1 ml amp. – parasympatholytic agent .*

- Indications: bradycardia and bradycardic arrhythmias in case of overdose of  $\beta$ -sympatholytics, in acute myocardial infarction to manage bradycardia-hypotension syndrome, premedication before general anesthesia, antidote in case of poisoning with acetylcholinesterase inhibitors (antidepressants, antipsychotics) or digitalis glycosides.
- Dosage:
  - children: In cardiology indications, a dosage of 0.01 to 0.02 mg/kg iv is recommended;
  - adults: In cardiology indications, doses of 0.5 to 1 mg iv are given, which can be increased up to 2 mg;
  - in case of poisoning with acetylcholinesterase inhibitors, 2 mg is administered iv, and if the effect is insufficient, the dose must be repeated at 5-minute intervals until signs of atropinization (redness,

dry skin, mydriasis, tachycardia);

- the highest single dose is 1 mg, the highest daily dose is 2 mg.

- Contraindications: tachycardia and tachyarrhythmia, increased intracranial and intraocular pressure, severe disturbance of acid-base balance, hypoxia, glaucoma, febrile conditions.
- Adverse effects: mydriasis, tachycardia, arrhythmia, accommodation disorder, headaches, increased intraocular pressure, autophobia, after higher doses thermoregulation blockade with hyperthermia, excitation, twitches to muscle spasms, hallucinations to loss of consciousness, constipation, urinary retention.

*Sedacoron inj. 150 mg/3 ml amp (Amiodarone, Cordarone)*

- Effect: causes a decrease in sinus automaticity leading to bradycardia unresponsive to Atropine administration. It increases coronary flow due to a direct effect on the smooth muscle of the coronary arterioles.
- Indications: CPR – ventricular fibrillation, severe supraventricular rhythm disturbances with a fast ventricular rate, in hemodynamically severe rhythm disturbances (ventricular tachycardia, severe forms of ventricular extrasystoles).
- Dosage:
  - CPR - bolus 300 mg (2 amp) in resistant ventricular fibrillation or tachycardia;
  - 5 mg Sedacoron/kg body weight is administered slowly over at least 3 minutes.
- Contraindications: sinus bradycardia, SA block, AV block, severe arterial hypotension, circulatory failure, thyroid dysfunction, lactation, severe respiratory insufficiency, decompensated cardiomyopathy.
- Adverse effects: hot flashes, sweating, nausea, drop in blood pressure, bradycardia, arrhythmia, or worsening of already existing arrhythmia, sometimes followed by cardiac arrest, anaphylactic shock, bronchospasm or apnea in severe respiratory insufficiency, especially in asthmatic patients.

*Rytmonorm 70 mg/20 ml amp. (ex. Prolecofen)*

- Effect: antiarrhythmic drug that reduces the rate of increase of the action potential, slows the conduction of impulses.
- Indications: acceleration of the heart rhythm arising outside the heart chambers (paroxysmal supraventricular tachycardia, atrial fibrillation, nodal tachycardia, severe ventricular tachycardia).
- Dosage:
  - single dose is 1 mg/kg of body weight → if necessary, the single dose can be increased up to 2 mg/kg;
  - application and injection must be slow for 3-5 minutes;

!!! If there is a widening of the QRS complex or a change in heart rate due to a prolongation of the QT interval by more than 20%, the injection of the product must be stopped immediately.

- Short-term infusion, 1-3 hours makes the dosage 0.5-1 mg/min. Glucose or fructose solutions (5%) should be used to prepare the infusion. Not suitable for FR.
- Contraindications: Known hypersensitivity to any substance of the product, cardiogenic shock, except for shock caused by arrhythmia, significant structural myocardial disease, uncontrolled congestive heart failure with left ventricular ejection fraction lower than 35%, severe symptomatic bradycardia, SA block, AV block II. and III. degrees, bundle branch block or intraventricular block in the absence of a pacemaker, severe hypotension, electrolyte imbalance (eg potassium metabolism disorders), COPD.
- Adverse effects: Marked bradycardia, conduction disturbances (eg, AV block), tachycardia, ventricular fibrillation, hypotension, vertigo, cephalgia, blurred vision, ataxia, anxiety, confusion, nausea, vomiting, abdominal pain, skin flushing, urticaria.

*Betaloc 5 mg/5 ml amp.*

- Sympatholytic, antihypertensive, cardioselective  $\beta$ -blocker, blocks only  $\beta_1$ -receptors of the myocardium. It has a beneficial effect on heart action, especially in supraventricular arrhythmias, atrial fibrillation and supraventricular extrasystoles, and increases the fibrillation threshold.
- Indications: tachyarrhythmia.
- Dosage:
  - we initially give up to 5 mg and at a rate of 1-2 mg per minute → can be repeated at five-minute intervals. A dose of 10-15 mg is usually sufficient. Doses higher than 20 mg are no longer therapeutically beneficial.
- It is not recommended to give the product to children.
- Contraindications: AV block II. and III. degrees, decompensated heart failure, sinus bradycardia, SA block, cardiogenic shock and severe peripheral arterial circulatory insufficiency, hypotension, bronchial asthma and COPD, metabolic acidosis. In patients with hypersensitivity to any component of the product or other beta blockers.
- Adverse effects: bradycardia, palpitations, transient worsening of heart failure symptoms, AV block I degree, chest pain, exertional dyspnea, bronchospasm, fatigue, dizziness and headache, paresthesia, muscle spasms, nausea, abdominal pain, diarrhea, constipation.

# Antibiotics

## *Cefotaxime inj. á 1 g*

- A broad-spectrum antibiotic.
- Indications: infections of the respiratory system, urinary tract, ear, nose and throat infections, endocarditis, meningitis, bone and joint infections, abdominal infections, gynecological infections, Lyme disease.
- Dosage: Add 4 ml of sterile water for injection to 1 g of cefotaxime. It is given slowly for 3 to 5 min iv
- Contraindications: in patients with known hypersensitivity to cefotaxime or to antibiotics from the cephalosporin group.
- Adverse effects: local reactions, allergic skin manifestations, gastrointestinal disturbances, anaphylaxis.

# Antidote

## *Naloxone inj. 0.4mg/1ml amp.*

- Effects: the only representative of the group of so-called "pure opioid receptor antagonists". Due to its high affinity for opioid receptors, naloxone displaces opioids bound to them and cancels the effects of an overdose of these substances.
- Indications: opioid intoxication, reversal of side effects after spinal or epidural opioid application.
- Dosage:
  - initial dose is 0.4 mg (1 amp.) to 2.0 mg iv, im, or sc → application may be repeated at 3-5 minute intervals;
  - in children, the initial dose is 0.005–0.01 mg/kg.
- Contraindications: hypersensitivity to Naloxone.
- Adverse effects: withdrawal symptoms, nausea, vomiting, sweating, tachycardia, increased blood pressure, psychomotor agitation, tremors, convulsions, and cardiac arrest.

## *Annexate inj. 0.5 mg/5 ml amp.*

- Effects: benzodiazepine antagonist.
- Indications: benzodiazepine intoxication, induced or maintained benzodiazepines to end general anesthesia.
- Dosage:
  - the initial dose is 0.2 mg IV, if necessary, it can be repeated at minute intervals up to a total dose of 1 mg;
  - for children older than 1 year, the recommended starting dose is 0.01 mg/kg (up to a total dose of 0.2 mg) administered iv;
  - in patients with liver insufficiency, it is advisable to administer Anexate in reduced doses.
- Contraindications: hypersensitivity to the active substance of the preparation, in patients with epilepsy who receive benzodiazepines as adjunctive treatment, in patients with a psychiatric history who are treated with BZD for this condition.
- Side effects: sleep disorders, vivid dreams, anxiety, feeling of tension, agitation, mood disorders, inner restlessness, tremors, sweating, confusion and sensory disturbances, sometimes even life-threatening conditions such as convulsions, psychosis and delirium, feelings of anxiety, palpitations, dyspnoea, insomnia, nervousness, tremor, cephalgia, hypotension, arrhythmia, convulsions, can cause a panic attack in patients with a diagnosis of panic disorder.

## *Carbo Sorb Pulvis 25 g*

- A universal antidote. It binds gases and toxic substances from the digestive system to the large surface of its particles, it does not bind metals to its surface. It is not absorbed by the body.
- Indications: acute diarrhea, intestinal infections caused by viruses and bacteria, acute poisoning with toxic substances, irritable colon, ulcerative colitis, gastritis, gastroenteritis.
- Dosage:
  - for diarrhea, adults are usually given 3–4 g 3–4 times a day; children 1.2–1.5 mg 4 times a day;
  - in intoxications up to 1 g/kg.

The product is mixed in a glass of water.

- Contraindications: the product is not given to children under 3 years of age.
- Adverse effects: reduced absorption of simultaneously administered oral drugs, black stool color.

# Antiemetics

## *Torecan inj. 6.5 mg/1 ml amp.*

- Effect: regulates the physiological processes associated with vomiting and dizziness.
- Indications: suppression of nausea and vomiting.
- Dosage:

- the recommended dose is 1 amp. iv;
- the drug should not be given to children under 15 years of age.
- Contraindications: hypersensitivity to the drug, in clinically significant hypotension, in children under 15 years of age.
- Adverse effects: somnolence, vertigo, cephalgia, convulsions, dyskinesia (involuntary jerky movements), peripheral edema of the limbs, facial edema, hypotension.

## Antihypertensives

*Ebrantil inj. á 25 mg/5 ml amp.*

- Effects: a reduction in pressure is induced based on a reduction in peripheral resistance. It inhibits the vasoconstrictive effect of catecholamines, reduces sympathetic tone.
- Indications: hypertensive crisis, hypertension resistant to conventional therapy.
- Dosage:
  - the effect can be expected within 5 minutes after administration;
  - slow iv injection or continuous infusion using a perfusor. We choose the speed of administration according to the individual reaction of blood pressure. The initial recommended rate is 2 mg/min.
- Contraindications: hypersensitivity to substances contained in the preparation, coarctation of the aorta, aortic stenosis.
- Adverse effects: nausea, vomiting, fatigue, palpitations, tachycardia, bradycardia, arrhythmia, AP, dyspnea, dizziness, headache, profuse sweating.

*Tensiomin tbl. á 12.5 mg/25 mg*

- ACE-inhibitors, antihypertensives.
- Effects: dilation of arterioles and veins.
- Indications: treatment of mild to moderate hypertension, for the therapy of congestive heart failure.
- Dosage:
  - initial dose is 12.5 mg / 3 times a day → maintenance dose is 25 mg / 3 times a day;
  - dosage usually does not exceed 50 mg / 3 times a day;
  - a total daily dose of 150 mg is usually not exceeded.
- Contraindications: hypersensitivity to substances contained in the preparation or to other ACE inhibitors, pregnancy and breastfeeding, bilateral renal artery stenosis, mitral stenosis and aortic stenosis, hypertrophic obstructive cardiomyopathy.
- Adverse effects: dizziness, feeling weak, impaired vision, shock, stupor, bradycardia or tachycardia, electrolyte disturbance, renal failure.

## Antihistamines

*Dithiaden inj. 1 mg/2 ml amp.*

- Effect: antihistamine with partial sedative effect.
- Indications: acute allergic conditions, reactions after insect bites, after administration of drugs or ingestion of food, anaphylactic shock.
- Dosage:
  - it is only diluted with 5% glucose. In case of anaphylactic shock, the application also follows the administration of Adrenaline, or glucocorticoids;
  - dosage is individual, according to the nature of the disease and according to tolerance. Initially, it is advisable to administer higher doses and then to be guided by the magnitude of the effect and the tolerable degree of drowsiness.
  - Injections can be administered IM or slowly.
- Contraindications: hypersensitivity to any component of the product, status asthmaticus, in all cases where drowsiness is the problem, breastfeeding.
- Adverse effects: general depression with the risk of reduced attention or, on the contrary, excitement, dry mouth with swallowing difficulties, thirst, visual disturbances, increased intraocular pressure, redness and dryness of the skin, disturbances of blood pressure, heart rhythm and frequency, decreased motility of the digestive system with constipation, disorders micturition, photosensitivity.

## Bronchodilation

*Bricanyl inj. 0.5 mg/1 ml*

- Effects: bronchodilator, antiasthmatic,  $\beta_2$ -sympathomimetic. By stimulating  $\beta_2$  receptors, it induces the relaxation of the smooth muscles of the bronchi and uterine muscles, therefore it can also be used to delay premature birth.
- Indications: bronchial asthma, chronic bronchitis, emphysema of the lungs.
- Dosage:

- for slow even application, dilute to 10 ml FR.

- 0.25–0.5 mg or 2–4 ml sc

- Contraindications: hypersensitivity to any component of the product.
- Adverse effects: tremor, headache, nausea, tonic muscle spasms, tachycardia and palpitations, urticaria.

*Syntophylline inj. 240 mg/10 ml amp.*

- Effects: bronchodilator effect, has a stimulating effect on the respiratory center, increases the frequency and strength of heart contractions, stimulates the CNS.
- Indications: asthma bronchiale, COPD, idiopathic apnea of newborns.
- Dosage:
  - the initial dose in adults is 10 ml (240 mg) iv, over 5 min. → maintaining the therapeutic concentration, it is possible to continue administering the maintenance infusion;
  - the maximum single dose is 500 mg, the highest daily dose is 1,500 mg;
  - children – stimulation of breathing in neonatal apnea, initial dose 6 mg IV/kg over 20 minutes, maintenance infusion 1 to 1.5 mg/kg/h.
- Contraindications: Intoxication of preparations containing theophylline, hypersensitivity to theophylline, thyrotoxicosis, severe liver insufficiency, tachydysrhythmia, acute myocardial infarction, epilepsy.
- Adverse effects: nausea, vomiting, pain in the epigastrium, diarrhea and bleeding in the gastrointestinal tract, increases the secretion of gastric juice, gastroesophageal reflux, sinus tachycardia or SVES or KES, hypotension, insomnia, increased irritability, headache or tremor, epileptic seizures, exanthemas of various type.

*Ventolin spr. (Salbutamol)*

- Effects: antiasthmatic, bronchodilator. In therapeutic doses, it affects beta1 receptors only minimally or not at all.
- Indications: for the treatment and prevention of a mild asthma attack and for the treatment of acute exacerbations of moderate and severe asthma, chronic bronchitis and COPD. The preparation can be used by adults, adolescents and children older than 4 years.
- Dosage:
  - inhalation by mouth (using Volumatic);
  - adults 100–200 µg (1 dose = 100 µg);
  - children 100 µg;
  - maximum use four times a day.
- Contraindications: in patients with a history of hypersensitivity to any component of the product.
- Adverse effects: bronchospasm, tachycardia, hypotension, collapse, tremor, cephalaea, urticaria.

*Berodual Spr. (Ipratropium Bromide + Fenoterol)*

- Bronchodilator, antiasthmatic.
- Effect: prevents bronchoconstriction caused by various stimulation stimuli, spasmolytic effect on bronchial muscles. Fenoterol inhibits uterine contractions.
- Indications: prevention and treatment of symptoms of chronic bronchial obstruction associated with reversible narrowing of airways, bronchial asthma, and especially COPD.
- Dosage:
  - administration of 2 inhalation doses (breaths) is in most cases sufficient to quickly eliminate acute symptoms → the same dose can be repeated after 5 minutes;
  - a maximum of 8 inhalations per day.
- Contraindications: hypersensitivity to the medicinal substances or to any auxiliary substance of this preparation, in patients with hypertrophic obstructive cardiomyopathy and tachyarrhythmia.
- Adverse effects: tachycardia, arrhythmia, cough, local irritation, pharyngitis, sudden bronchospasm, laryngospasm.

## Diuretics

*Furosemide inj. 20 mg/2 ml amp., 125 mg/10 ml amp.*

- Effects: loop diuretic, effective even with significantly reduced kidney function. It causes increased excretion of potassium, has a hypotensive effect.
- Indications: acute and chronic edema, cardiac edema, edema in nephrotic syndrome or cirrhosis of the liver, late gestosis, brain edema, hypercalcemia and hyperkalemia, forced diuresis.
- Dosage:
  - children are given 1–2 mg/kg iv daily → the maximum daily dose is 6 mg/kg body weight;
  - in adults, 20–40 mg IV is usually administered → the same or increased dose can be repeated at 6–8 hour intervals;
  - in case of acute pulmonary edema, the initial dose is 40 mg IV, if the effect is insufficient, the same

or double the amount is applied at 2-3 hourly intervals. The rate of application should not exceed 4 mg Furosemide per minute;

- in case of forced diuresis, 500–1000 mg is given in a volume of 400 ml of electrolyte solution. The rate of application should not exceed 4 mg Furosemide/min.
- Contraindications: hypersensitivity to furosemide or any excipient, acute glomerulonephritis, renal insufficiency with anuria, hyponatremia, hypokalemia, metabolic alkalosis.
- Adverse effects: hypokalemia and conditions associated with it - fatigue, lethargy and muscle weakness, cardiac arrhythmia (KES, VF), in high doses it usually causes temporary deafness, but exceptionally hearing loss can be permanent, exanthema, beware of patients with prostate hypertrophy, acute urinary retention may occur.

## Expectorant, mucolytic

*Mistabron (Mesna) 200 mg/1 ml amp.*

- Indications: to facilitate suctioning from the bronchi in intensive care and during CPR and general anesthesia.
- Dosage: by endotracheal tube or tracheostomy cannula 1–2 ml (200–400 mg) of solution diluted with the same volume of FR, or Aqua for inj.
- Contraindications: hypersensitivity to any substance contained in the preparation, status asthmaticus, in case of severe renal insufficiency.
- Adverse effects: chest pain, cough, bronchospasm, angioedema, urticaria.

## Hemostyptics

*Remestyp inj. 1 mg/10 ml amp. (ex. Terlipressin)*

- Effects: significant vasoconstrictor and antihemorrhagic.
- Indications: bleeding from the digestive and urogenital system in adults and children. Esophageal varices, gastric and duodenal ulcers, during functional metrorrhagia, during childbirth and abortion, etc., bleeding associated with operations, especially in the abdomen and small pelvis, local use, e.g. during gynecological operations on the cervix.
- Dosage:
  - the initial dosage is 1–2 mg as a bolus → continue until the bleeding stops by repeating the dose every 4 hours for a minimum of 24 hours.
- Contraindications: administration is contraindicated during pregnancy. Hypersensitivity to any excipient.
- Adverse effects: pallor, bradycardia, hypertension, abdominal pain, nausea, diarrhea, headache.

## Corticosteroids

*Dexamed inj. á 8 mg/2 ml Synthetic glucocorticoid.*

- Effects: anti-inflammatory, anti-allergic, antipyretic and immunosuppressive effects.
- Indications: allergic diseases, bronchial asthma, including status asthmaticus, drug allergic reactions, post-transfusion reactions, serum sickness, laryngeal edema, anaphylactic reactions, shock states, cerebral edema.
- Dosage:
  - it is dosed according to the patient's condition in the range of 0.5–20 mg.
- Contraindications: hypersensitivity to any auxiliary substance of this preparation, systemic infections, local administration is contraindicated in bacteremia, systemic fungal infections, unstable joints.
  - If the use of glucocorticoids can be life-saving, contraindications are usually not considered.
- Side effects:
  - chronic NU: Painless osteoporosis, systemic reactions, growth suppression in childhood and adolescence, irregular menstruation and amenorrhea. Cushingoid face, hirsutism, weight gain, increased appetite, fractures of long bones and vertebrae, retention of sodium, water, rise in blood pressure, hypokalemic alkalosis and potassium losses, worsening of schizophrenia, depression, insomnia, psychological dependence, worsening of epilepsy, increase in intraocular pressure, papilledema, thinning of the cornea or sclera, cataract, dyspepsia, peptic ulcer, acute pancreatitis, vomitus, hematomas, deterioration of healing, stretch marks, thromboembolism.
  - Acute AE: Anaphylactic allergic reaction with or without circulatory collapse, cardiac arrest, bronchospasm, cardiac arrhythmia, hypotension or hypertension.

*Hydrocortisone inj. 100 mg/amp.*

- Corticosteroid, the effect is relatively high compared to other preparations of this group.
- Indications: anaphylactic shock, toxic-infectious shock, malignant hyperthermia, venomous snake bites, polytrauma, inhalation trauma, acid aspiration, acute attack of asthma bronchiale, allergic reactions...
- Dosage:

- up to 150 mg/kg, slowly, even while replenishing the enlarged bloodstream with a replacement solution;
  - in case of an allergic reaction with symptoms of bronchospasm, hypotension, etc., 100–300 mg iv is administered;
  - children are given 2–8 mg/kg/day;
  - up to 1 year 7–20 mg;
  - from 1–6 years 20–50 mg;
  - from 6–15 years 50–100 mg/day.
  - For bacteriotoxic and anaphylactic shock, the single dose is up to 30 mg/kg.
- Contraindications: TB, herpes zooster ophthalmicus, acute psychosis, peptic ulcer, coagulopathy with thromboembolic complications, Cushing's syndrome, suspected abdominal emergency, acute glaucoma.
  - Adverse effects: hypotension, thromboembolism, muscle weakness with muscle atrophy, suppression of immune reactions, DM decompensation, development of glaucoma, gastric hemorrhage, intestinal perforation.

## Myorelaxans

### *Succinylcholine iodide inj. á 100 mg*

- Effects: very short-acting depolarizing peripheral muscle relaxant, excellently relaxes especially the muscles of the larynx. The effect is manifested by muscle contractions (depolarization wave), followed by relaxation.
- Indications: tracheal intubation, procedures requiring short-term relaxation, laryngospasm.
- Dosage:

!!!only iv, only after introduction to general anesthesia.

- for adults 1% solution – 100 mg SCCHJ + 10 ml FR (10 mg/1 ml) 0.75–1.25 mg/kg;
  - newborns and small children 0.5% solution up to 2 mg/kg.
- Contraindications: hypersensitivity to the product, lack of equipment for artificial pulmonary ventilation, inability to provide artificial respiration, intracranial arterial aneurysm, decompensated glaucoma, open bulb, severe intracranial hypertension, severe bradycardia, compression fractures of the spine and vertebral dislocation, spinal cord injury, history of malignant hyperthermia, lung function disorder.
  - Adverse effects: prolonged relaxation, bradyarrhythmia up to cardiac arrest, bronchospasm, sinus tachycardia, increased intracranial, intraocular, intragastric and intra-abdominal pressure, increased peristalsis, salivation, bronchorrhoea, malignant hyperthermia in predisposed persons.

### *Pavulon 4 mg/2 ml*

- Effects: non-depolarizing muscle relaxant - does not cause muscle fasciculations.
- Indications: general anesthesia to facilitate tracheal intubation and to induce relaxation of skeletal muscles during medium and longer surgical procedures.
- Dosage:
  - the standard intubation dose during anesthesia is 0.08–0.1 mg/kg. Acceptable conditions for intubation occur approximately 90–120 seconds after IV administration.
- Contraindications: hypersensitivity to any component of Pavulon.
- Adverse effects: the most common are changes in vital functions, prolonged neuromuscular block, anaphylactic reactions.

## Ophthalmologica

### *Ophtal OPH AQA 2x50 ml*

- Effects: has a mild antiseptic effect and bactericidal properties. It is well tolerated even in allergic patients.
- Indications: non-infectious conjunctivitis, poultices after light conjunctival burns, removal of foreign bodies by lavage from the conjunctival sac, lavage after eye burns with acids, lye and lime, after separation of necrotic tissues, treatment of chronic conjunctivitis.
- Use
  - Place the tub half filled with the preparation on the edge of the eye socket, tilt the head slightly and immerse the eye in the bath. With slow movements of the eye, we allow contact of the Ophtal product with the entire surface of the bulb.
  - We apply the bath for 2–5 min. and we can repeat it 3x–5x a day.
  - Ophtal can also be instilled into the eye or used as a poultice.
- Contraindications: the product must not be used in case of known hypersensitivity to any component of the product and in case of keratitis sicca.
- Side effects: burning and eye irritation after application.

## Psychotropic drugs

*Haloperidol 5 mg/1 ml* Effects: antagonist of dopamine receptors, ranks among strong neuroleptics. It causes significant psychomotor depression in manic states and other syndromes with agitation.

- Indications: delusions and hallucinations, acute and chronic schizophrenia, paranoia, acute confusion, mania, alcoholism, personality disorders, aggression, hyperactivity, self-harm in patients with mental disorders and in people with organic brain damage. As an adjunct to the short-term treatment of moderate to severe psychomotor agitation, excitement, violent or dangerous impulsive behavior. As an antiemetic, if classic anti-nausea and vomiting preparations have not been effective.
- Dosage:
  - as an antiemetic 0.5 to 2 mg iv or im;
  - acute phase 2 to 10 mg iv or im, the dose can be repeated every 4-8 hours (depending on the therapeutic response). Severely affected patients may require an increase in dose up to 18 mg/day.
- Contraindications: hypersensitivity to any component of the product or to other butyrophenone derivatives, comatose states, CNS depression induced by alcohol or other centrally depressant substances, Parkinson's

disease, clinically significant cardiac disease, ventricular arrhythmia in history, bradycardia, in children and adolescents under 18 years of age.

- Adverse effects: muscle rigidity, generalized or localized tremor, hypotension, sedation, hypertension, rarely comatose state, respiratory depression with hypotension and shock state, ventricular arrhythmia.

## Sedatives, anticonvulsants

*Apaurin inj. 10 mg/2 ml amp. (Diazepam, Seduxen); Diazepam rectal á 5 mg*

- Effect: benzodiazepine with anticonvulsant and muscle relaxant action.

!!!Oil - do not dilute!

- Indications: for AIM – increases the fibrillation threshold, induces sedation. Acute states of anxiety and excitement, withdrawal syndrome (delirium tremens), status epilepticus, tetanus, acute central and peripheral muscle spasms, premedication, introduction to anesthesia, cardioversion, minor surgical interventions, endoscopy.

During pregnancy to facilitate the initiation of labor, during bed rest, gestational eclampsia and preeclampsia.

- Dosage:
  - in acute conditions, the dose may be repeated after one hour. The usual interval between doses is 4 hours.
  - Adults 5 to 10 mg iv or im, the highest dose is 3 mg/kg over 24 hours.
  - Children 2 to 10 mg iv or im
  - For small children under 6 months only in urgent cases.
- Contraindications: hypersensitivity to the medicinal substance or to any auxiliary substance of this preparation, glaucoma, myasthenia gravis, severe pulmonary insufficiency, acute intoxication with alcohol or other CNS depressants, coma.
- Adverse effects: thrombosis, phlebitis or thrombophlebitis at the injection site, in some cases dizziness and muscle weakness, confusion, depression, frightening dreams, memory loss and dysarthria. The use of benzodiazepines can lead to the development of physical and psychological dependence.
- ANTIDOTUM: ANEXATE.

*Midazolam 5mg/5ml plastic. amp. (Dormicum)*

- Effects: benzodiazepine, hypnotic, sedative. It causes retrograde amnesia.
- Indication: induction of sedation while consciousness is preserved.
- IV and IM applications are possible.
- Dosage: the initial dose is 0.03-0.3 mg/kg. → the maintenance dose is 0.03-0.2 mg/kg/hour.
- Contraindications: myasthenia gravis, hypersensitivity to the medicinal substance, severe respiratory insufficiency, sleep apnea syndrome, severe renal insufficiency, acute intoxication with alcohol, hypnotics, neuroleptics, antidepressants or lithium, acute angle-closure glaucoma.
- Adverse effects: depression to respiratory arrest, cardiac arrest, changes in blood pressure and heart rate. !!! After prolonged intravenous administration, sudden discontinuation may lead to withdrawal syndrome.
- ANTIDOTUM: FLUMAZENIL (ANEXATE).

*Rivotril inj. 1 mg/1 ml amp. + amp. with solvent*

- Effect: anticonvulsant, sedative, myorelaxant and antiaggressive effect.
- Indications: epilepsy, status epilepticus, panic disorder, sudden unexpected attacks of anxiety and fear.
- Dosage:
  - status epilepticus in infants and children after dilution with solvent initial dose 1/2 amp. (0.5 mg) and adults 1 amp. (1 mg), iv;
  - the injection rate must not exceed 0.25 to 0.5 mg/min (0.5 to 1.0 ml of the prepared solution);
  - a total dose of 10 mg should not be exceeded.
- Contraindications: hypersensitivity to the medicinal substance or to any auxiliary substance of this preparation or to other drugs from the benzodiazepine group, myasthenia gravis, liver insufficiency, severe respiratory

insufficiency, sleep apnea syndrome.

- Adverse effects: anaphylaxis, restlessness, states of confusion, disorientation, depression, nervousness, sleep disorders, nightmares and vivid dreams, somnolence, slowed reactions, muscle hypotonia or, on the contrary, irritability, aggression, agitation, dizziness, ataxia, headache, dysarthria, impaired movement coordination, anxiety, nystagmus, anterograde amnesia, heart failure including cardiac arrest, respiratory depression, nausea, risk of thrombophlebitis, thrombosis. The use of benzodiazepines can lead to the development of physical and psychological dependence.
- ANTIDOTUM: ANEXATE.

## Spasmolytics

*Analgin inj. 5 ml (Algifen inj.)*

- Antispasmodic.
- Indications: for colic pains of the biliary and urinary tracts, tenesmus of the bladder, painful spasms of the stomach and intestines, spastic dysmenorrhoea and for the suppression of spastic pains during and after instrumental examination.
- Dosage:
  - children from 4-12 months dose 0.2-0.3 ml im;
  - children 1-6 years 0.3-0.5 ml;
  - children of school age (7-12 years) 0.6-1 ml;
  - adults are given a single dose of up to 5 ml;
  - the dose may be repeated after 6-8 hours. The daily dose should not exceed 10 ml.

!!!The intravenous solution must be administered very slowly (1-1.5 ml/min) to a lying patient. During application, blood pressure, pulse and respiratory rate must be monitored.

- Contraindications: pregnancy and lactation, children under 4 months of age, prostate hypertrophy, glaucoma, severe heart insufficiency, recent myocardial infarction, tachycardia, mechanical stenosis of the digestive tract, megacolon, patients with hematopoietic disorders and patients treated with cytostatics.
- Adverse effects: a sharp drop in blood pressure to shock, in sensitive patients it can provoke an asthma attack.

*No-Spa inj. 40mg/2ml*

- Effects: affects the smooth muscles of blood vessels, the smooth muscles of the bile ducts, genitourinary, respiratory and digestive tracts. It does not affect the vegetative nervous system, it is also suitable for patients with glaucoma or prostate hypertrophy.
- Indications: smooth muscle spasms of various etiologies.
- Dosage:
  - acute biliary or renal colic 40-80 mg slowly iv (within about 30 s), possibly in combination with a non-opiate analgesic;
  - other abdominal painful spasms 40-80 mg IM, if necessary can be repeated, but no more than 3 times a day;
  - for pain during or after childbirth 40 mg IM
- Contraindications: severe hepatic or renal insufficiency, severe cardiac insufficiency, children.
- Adverse effects: rarely nausea and constipation, headache, dizziness, insomnia, palpitations, hypotension, reactions at the injection site.

## Sympathomimetics

*Adrenaline inj. 1 mg/ml*

- Effects: depending on the administered dose, it stimulates  $\alpha$  and  $\beta$  adrenergic receptors. It is suitable for children and adults.
- Indication:
  - cardiac arrest – toning of the myocardium during CPR, asystole, fine-wave ventricular fibrillation resistant to defibrillation shock;
  - failure of peripheral blood circulation with sufficient blood vessel filling;
  - anaphylactic and endotoxin shock, bronchospasm, vasoconstriction during local anesthesia, limitation of capillary bleeding.
- Dosage:
  - administration iv, io, sc;
  - cardiac arrest adults 0.01 mg/kg (0.5-1 ml) iv, io, children 0.01 mg/kg;
    - further doses 0.1 mg/kg/3-5 min. iv, neonates 0.01-0.03 mg/kg/3-5 min. iv;
  - anaphylactic shock adults 0.3-0.5 ml iv;
  - allergic conditions adults 1 ml deep sc, maximum 2 ml/day; children under 1 year 0.1-0.2 ml, from 1 to 6 years 0.2-0.3 ml, from 6 to 15 years 0.3-0.5 ml sc

- Contraindications: hypersensitivity to epinephrine or to another component of the product, glaucoma, severe hypoxia and hypercapnia, simultaneous administration of MAO inhibitors, treatment with tricyclic antidepressants, hypertension, hypovolemia, advanced age with severe atherosclerosis, pheochromocytoma, hypertrophic subaortic stenosis.

- It must not be used for vasoconstriction during local anesthesia of the nose, ears and fingers.

!!!It is necessary to assess all contraindications in immediately life-threatening conditions on an individual basis.

- Adverse effects: restlessness, tremors, anxiety, nausea, vomiting, headache, arrhythmia, tachycardia and bradycardia, hypertension and hypotension, angina pectoris, shortness of breath, palpitations, ventricular arrhythmias, local reactions.

#### *Dobutamine inj. á 250 mg*

- Effects:  $\beta_1$  sympathomimetic, affects only the myocardium.
- Indications: heart failure with low output, cardiac surgery, cardiomyopathy, septic and cardiogenic shock requiring positive inotropic treatment.
- Dosage:
  - Dilute to 20 ml FR or RF, slow administration under ECG monitoring.
  - Adults 5–10  $\mu\text{g/kg/min}$ , children 1–15  $\mu\text{g/kg/min}$ .
- Contraindications: pericardial tamponade, severe aortic stenosis, severe hypovolemia.
- Adverse effects: tachycardia, headache, chest pain, increased systolic blood pressure, nausea, palpitations, dyspnoea. Adverse effects are usually dose-dependent and disappear if the dosage is reduced or temporarily discontinued.

#### *Noradrenaline inj. 1 mg/1 ml amp.*

- Effects: depending on the administered dose, it stimulates  $\alpha$  and  $\beta$  adrenergic receptors. It is suitable for children and adults for short-term use only.
- Indications: prophylaxis or therapy of acute hypotension, therapy of shock states unresponsive to volume replenishment with fluids, trauma, sepsis, kidney failure, heart surgery, chronic cardiac decompensation, drug intoxication, anaphylactic reaction, etc.
- Dosage:
  - administered exclusively by IV infusion, diluted with 5% glucose or FR;
  - children are given 0.1  $\mu\text{g/kg/min}$ , no more than 1  $\mu\text{g/kg/min}$  according to the level of blood pressure;
  - adults are given 0.5–1  $\mu\text{g/min}$  according to the level of blood pressure, the maintenance dose is 2–12  $\mu\text{g/min}$ ;
  - patients with refractory shock can be given up to 30  $\mu\text{g/min}$ .
- Contraindications: subaortic stenosis, pheochromocytoma, tachyarrhythmia or VF, HRT, hypersensitivity to any component of the product.
- Adverse effects: arrhythmia, tachycardia, bradycardia, angina pectoris, headache, shortness of breath, palpitations, ventricular arrhythmias, extravasal administration may lead to tissue necrosis.

#### *Tensamine 200 mg/5 ml amp. (Dopamine)*

- Effects: at low and medium doses, it mainly has a  $\beta$ -mimetic effect, while after high doses, the  $\alpha$ -mimetic effect is more pronounced. Adequate doses increase cardiac contractility and cardiac output. Increases blood flow through the kidneys, mesenteric and coronary canals.
- Indications: part of complex therapy in case of acute perfusion failure in vital organs (primarily in the kidneys) and for the prophylaxis of vasoconstriction in the splanchnic area during blood centralization and redistribution. It serves to prevent multi-system and multi-organ disability. Another indication is congestive heart failure, postoperative, traumatic, anaphylactic and endotoxin shock, early burn shock, cardiogenic and septic shock, poisoning, pancreatitis, neurogenic shock with high spinal cord lesions. Small doses (2–4  $\mu\text{g/kg/min}$ ) are indicated for artificial lung ventilation with the inclusion of PEEP.
- Dosage and method of use:
  - hypovolemia should be corrected before administration;
  - it is always necessary to monitor the ECG;
  - when higher doses are administered by infusion, arterial pressure monitoring is appropriate;
  - !!! it must never be applied undiluted;
  - it is administered only by IV infusion, the rate of which must be strictly controlled, preferably by an infusion pump or perfusor;
  - it must not be diluted with alkaline solutions in which it is inactivated.
    - Beta effect 5  $\mu\text{g/kg/min}$  (nephroprosthetic effect).
    - Alpha effect 10  $\mu\text{g/kg/min}$  (releases Noradrenaline → is dependent on noradrenaline stores at the sympathetic endings in the heart).
- Contraindications: pheochromocytoma, tachyarrhythmia or KES, marked hypokalemia, alkalosis, hypoxia or hypovolemia without simultaneous correction of these conditions. Administering dopamine during pregnancy is reserved only for extreme cases when it is a question of saving the mother's life.
- Adverse effects: increase diuresis even at borderline perfusion pressure, which can falsely mask a serious

condition. Higher and high doses can cause tachycardia, palpitations, vasoconstriction, bradycardia, dilatation of the ventricular complex, dyspnoea, nausea, headache and vomiting, sudden decrease in diuresis and pulmonary edema from left-sided heart failure.

## Tocolytics

*Gynipral inj. 10 µg /2 ml amp.*

- Effects: reduces or completely stops the frequency and intensity of uterine contractions, suppresses both spontaneous and Oxytocin-induced contractions. The onset of effect immediately after iv application, lasts about 20 minutes.
- Indications: suppression of uterine contractions during childbirth, in case of acute intrauterine asphyxia, calming before "caesarean section", before turning the fetus from the transverse position, in case of prolapse of the umbilical cord, in dystocia, in necessary cases during premature uterine contractions before transfer to the hospital, attenuation of premature contractions during shortening or opening of the cervix. Prevention of preterm labor with stronger or more frequently recurring contractions without shortening or opening the cervix, calming the uterus before, during or after cerclage.
- Dosage:
  - in case of acute tocolysis, 10 µg with 10 ml of FR or 5% glucose is administered slowly i.v. over a period of 5-10 min → if necessary, continue the infusion at a dose of 0.3 µg/min;
- Contraindications: hypersensitivity to any of the components of the product, asthma, hyperfunction of the thyroid gland, more severe cardiovascular disease, tachyarrhythmia, myocarditis, mitral defects, aortic stenosis, hypertension, pheochromocytoma, severe liver and kidney disease, glaucoma, severe uterine bleeding (premature separation of the placenta), intrauterine infection, under 20 weeks of pregnancy.
- Side effects: there are none, it is generally well tolerated.

## Uterotonics

*Methylergometrine 0.2 mg/1 ml amp.*

- Effects: uterotonic. Its use is not considered during pregnancy and breastfeeding.
- Indications: therapy and prevention of acute uterine bleeding after childbirth, after evacuation or revision of the uterine cavity after abortion, medical management III. the birth period after the delivery of arms.
- Dosage:
  - given 1 amp iv slowly, while monitoring BP, over 1 min or im, sc or cervical (after abortion);
  - to reduce blood loss and shorten III. 1 amp is administered during labor. even just after delivery of the head or arms of the fetus.
- Contraindications: pregnancy, I. and II. delivery time, sepsis, cardiovascular diseases, deterioration of liver or kidney function, hyperthyroidism.
- Adverse effects: headache, vertigo, tinnitus, rarely even hallucinations, abdominal pain, nausea, vomiting, diarrhea, chest pain, palpitations, sometimes bradycardia, dyspnoea. With intravenous administration, the risk of a sudden rise in blood pressure, syncope with hypotension.

*Oxytocin 5 IU/1 ml amp.*

- Effects: synthetic hormone, used for induction and stimulation of uterine activity during pregnancy and childbirth. The sensitivity of the uterus to Oxytocin changes significantly during pregnancy, it is low at the beginning and reaches its maximum at the time of delivery. During lactation, it increases the ejection (not the secretion) of milk.
- Indications: induction of labor at appropriate cervical maturity, stimulation of primarily and secondarily weak uterine contractions without anatomical obstruction in the birth canal, medical assistance in cephalic delivery in breech position. Hypotonia and atony of the uterus after childbirth or abortion.
- Dosage:
  - breech birth 2-5 IU also in the form of a bolus after umbilical cord attachment;
  - uterine hypotonia and atony 2-5IU also in bolus form. After achieving the effect, it is advisable to ensure uterine contraction with methylergometrine;
  - a dose of 5 IU can also be applied to the muscle of the cervix;
  - induction and provocation of labor and abortion 5 IU in 500 ml of 5% glucose in iv infusion for continuous control of uterine labor and fetal echoes (KTG).
    - The rate of infusion is completely individual, at the beginning usually about 10 drops/min. Depending on individual sensitivity, up to 30 drops/min. We leave the infusion until the end of the birth, preferably shortly after the birth of the bed.
  - In the case of caesarean section, it is advisable to apply 5 IU into the myometrium immediately after equipping the fetus.
- Contraindications: hypersensitivity to oxytocin and related substances, premature separation of the placenta, hypertonic uterine contractions, imminent rupture of the uterus and some irregular positions of the fetus that could lead to it.

- Adverse effects: increased postpartum bleeding, vomiting, allergic reactions and arrhythmias (most often maternal or fetal bradycardia). After prolonged intravenous infusions, water retention up to water poisoning, alteration of fetal sounds, hypertension or hypotension and shock may occur rarely.

## Vasodilators

*Perlinganit 10 mg/10 ml* Effects: vasodilatation is induced by relaxation of vascular smooth muscles. It leads to a decrease in heart activity.

- Indications: severe anginal syndrome, left ventricular failure with subacute and acute pulmonary edema, controlled hypotension.
- Dosage:
  - perlinganite solution is used under constant control of circulatory functions, both undiluted and diluted in the form of long-term infusion through a perfusor.
  - In cases of acute left-sided heart failure with pulmonary edema, treatment is started slowly and with an injection of 1 mg/ 3 min. and continues with an infusion of 2–8 mg/hour.
- Contraindications: hypersensitivity to any substance contained in the preparation, acute circulatory failure (shock, circulatory collapse), cardiogenic shock, severe hypotension (at systolic pressure below 90 mmHg), severe hypovolemia, severe anemia, hypertrophic obstructive cardiomyopathy, constrictive pericarditis, cardiac tamponade .
- Adverse effects: headache, dizziness, somnolence, tachycardia, myocardial hypoxia.

*Isoket spray*

- Effects: causes relaxation of vascular smooth muscle and subsequent vasodilation.
- Indications: acute coronary syndrome, supportive treatment of acute left-sided heart failure.
- Dosage:
  - the dosage must be adjusted individually according to the needs of the patient.
  - During an attack or shortly before physical or mental stress that can trigger an attack, 1-3 doses of the solution are injected into the oral cavity (preferably sublingually) at 30-second intervals.
  - Acute coronary syndrome dose 3 injections. → if the patient does not respond to the treatment within 5 min., another injection can be administered → if the condition does not improve within 10 min., another dose can be administered with continuous blood pressure checks.
- Contraindications: hypersensitivity to any of the substances contained in the preparation, acute circulatory failure (shock, circulatory collapse), cardiogenic shock (if sufficient filling pressure is not ensured in a suitable way), significant hypotension (systolic blood pressure lower than 90 mmHg).
- Adverse effects: headache, hypotension, shock state.

## Links

<http://medicabaze.cz/>

## Source of information

- drug package leaflets