

Gomel state medical University

Department of neurology and neurosurgery with
courses of medical rehabilitation, psychiatry, FPDaR

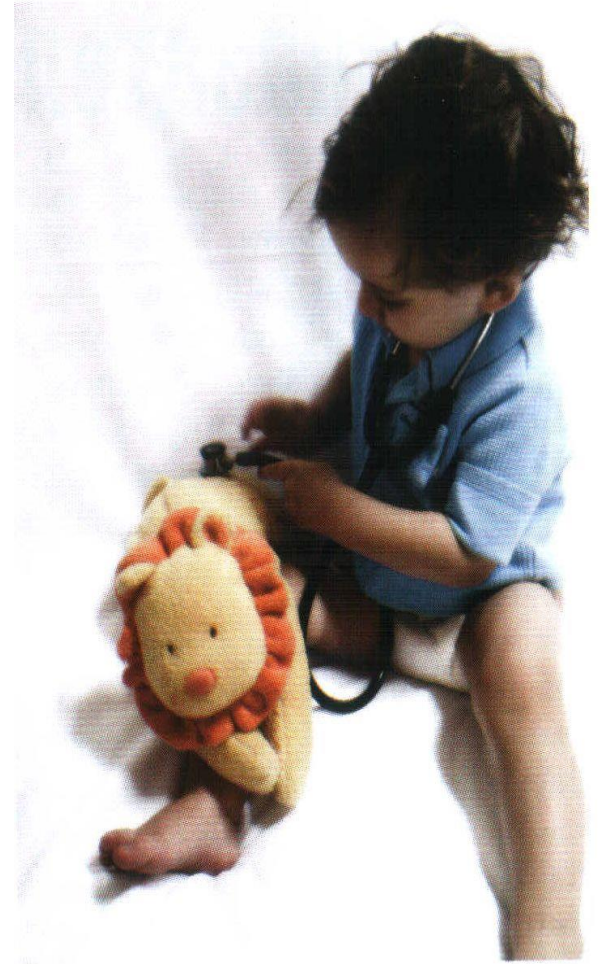
***Fundamentals of physiotherapy. Direct current
and prophylactic use. Pulse electrotherapy.***

2021

Plan of the lecture

- 1. The definition of the subject**
- 2. Natural factors**
- 3. The therapeutic effects of physical therapy**
- 4. The individual characteristics of the child's body in the physiotherapy**
- 5. Galvanization**
- 6. Electrophoresis**
- 7. Impulse electrotherapy**

PHYSIOTHERAPY is an area of medicine, studying effects on the body of natural and artificially created by physical factors used to treat the sick, prevention of diseases and medical rehabilitation.



The subject of study physiotherapy are Therapeutic physical factors

Artificial

- electrotherapy
- magnetic therapy
- phototherapy
- heat and hydrotherapy



Natural

- climate
- balneotherapy
- mud therapy



Physiotherapy is characterized by certain advantages:

- **The most physiological methods, as applied to the usual natural physical factors.**
- **Painless and sterility.**
- **Long-lasting effect.**
- **No side effects common to medication treatment.**
- **Wide variety of instruments and availability of treatment**

The therapeutic effects of physical therapy local:

- 1. Anesthesia**
- 2. Drying wounds**
- 3. Bactericidal action**
- 4. The acceleration of epithelialization of tissue**
- 5. Withdrawal itching**
- 6. Reduction of swelling**
- 7. The softening of scar tissue**
- 8. Improving the contractility of the nerve, muscle**
- 9. Removal of muscle spasm**

General therapeutic effects:

- 1. Sedation**
- 2. Activation of the metabolism**
- 3. Activation of the immune system**
- 4. Activation of the endocrine system**
- 5. Improvement of blood circulation**
- 6. The decrease in blood pressure**

General contraindications for physiotherapy treatment:

- 1. High fever.**
- 2. Of a malignant tumor.**
- 3. Bleeding tendency or blood disease.**
- 4. Tuberculosis in an active form.**
- 5. Cardio-vascular insufficiency IIA above the stage.**
- 6. Acute mental illness.**

The individual characteristics of the child's body that must be considered when assigning the physical therapy

- 1. The nervous system is not finished in development. Hence the sensitivity of the organism to the procedures increased.**
- 2. Regulatory mechanisms and imperfect thermoregulation easily broken.**
- 3. Blood pressure is lowered.**
- 4. Skin has high permeability.**

Features of the procedure in children

- **During the day appoint only single procedure. Rest after the procedure.**
- **The current density and the salt concentration is less.**
- **In sanatoriums a longer treatment time.**
- **No earlier than one hour after feeding and not later than 30 minutes before the next feeding.**

Physical prevention

Primary physical prevention	Secondary physical prevention
<p>Used to enhance the body's resistance to acute respiratory infections, development of adaptive capacity to adverse environmental factors, improve health and Zakalennoye healthy individuals, compensation of UFO-failure etc.</p>	<p>Used in patients and has the goal of preventing relapses or further progression of the disease, strengthening the body, more rapid recovery of normal functioning and disability.</p>

Galvanizing – the use for therapeutic purposes of continuous permanent electric current of low power (up to 50mA) and low voltage (30 - 80V).

Parameters:

- the maximum current used during electroplating of the limbs (20-30mA) and torso (15-20mA)**

face does not exceed 3-5 mA

- on mucous membranes of mouth and nose – 2-3mA**

Galvanic current causes a General reaction of the organism and depends on the location, intensity and duration of exposure

Therapeutic effects:

- **Galvanizing contributes to the regulatory functions of the nervous system**
- **To accelerate the regeneration of the damaged peripheral nerve fibers, muscle, and epithelial tissues.**
- **In tissues intensify redox processes and resorption, blood and lymph circulation**
- **Galvanic current affects the exchange of mediators (histamine, serotonin, etc.) not only in the skin but throughout the body**

Under the influence of galvanic current on the skin in one or two adjacent metameres occur local reactions:

- Therapeutic effects, for example, the location of electrodes in the liver and right subscapular region enhances the blood flow in the vessels of the liver and improve its metabolism;
- when applying electrodes in the upper part of the lumbar region changes the functional state of the adrenal glands and all of sympathoadrenal system; in the blood increases the content of adrenaline and noradrenaline
 - under the influence g. current stimulated phagocytic activity of leukocytes and the whole of the mononuclear phagocyte system, improves trophic function of the vegetative nervous system etc.

Indications

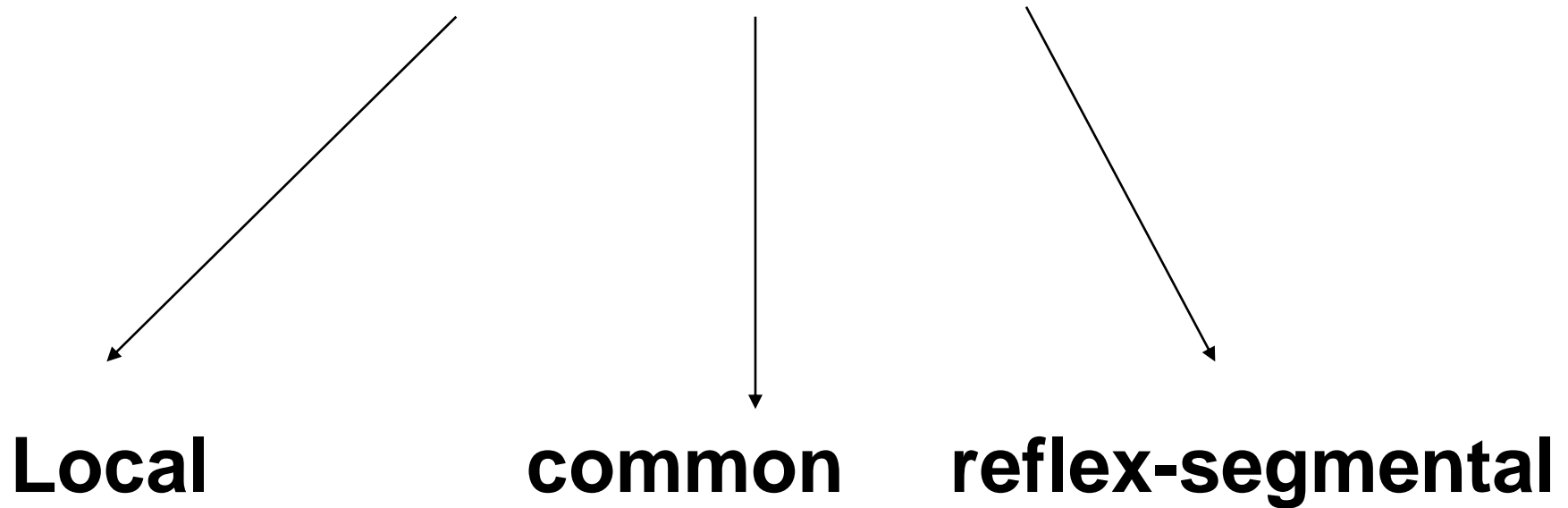
For the application of electroplating are:

- Disorders of the peripheral nervous system of infectious, toxic and traumatic origin (polyradiculoneuritis, radiculitis, neuritis and neuralgia of different localization), the consequences of infectious and traumatic lesions of the Central nervous system; nervous conditions; migraines, vasomotor disorders, trophic, functional gastrointestinal and sexual dysfunction, myositis, diseases of eye, some dental diseases (stomatitis, etc.), etc.**

Contraindications

- **Acute purulent inflammatory processes**
- **Sharply pronounced atherosclerosis and other diseases of the cardiovascular system in the stage of decompensation**
- **Tumors**
- **Skin diseases or violation of the integrity of the skin in areas of electrode placement**
- **Pregnancy**
- **Individual intolerance galvanic current**

Depending on therapeutic tasks use techniques



Electrophoresis – a combined influence on the organism of a constant electric current and input with the help of medicinal substances

Therapeutic effect

1. expansion of blood and lymphatic vessels;
2. relaxation;
3. normalization of metabolism;
4. the normalization of the endocrine glands;
5. improve metabolism of cells;
6. stimulation of secretion of biologically active substances.

Indications: Determined with pharmacological into account the input of substances and indications for galvanization.

Contraindications: with galvanization + intolerance, allergic reactions to injected medications

Impulse electrotherapy

- **electric currents characterized by short-term changes in voltage or current.**

Widely used for therapeutic purposes alone as the basis of different methods of electrotherapy, and in combination with other therapeutic factors.

The advantages of applying a impulse current

- **the relatively slow development of habituation of the tissues to the action of physical factors**
- **clear specific action, i.e. the action that distinguishes one factor from another**
- **intensive therapeutic effect with minimum stress on the body**

Main effects in tissue

- **Electrostimulating**
- **Anesthetic**
- **Improvement of conductivity of electric current fabrics**
- **Trophic**
- **Plastic**
- **Increase in the functional activity of the CNS**
- **Secretory**

Indications for application of impulse currents

- **anti-inflammatory and analgesic effects**
- **Paresis, paralysis.**
- **Pain syndromes of different Genesis**
- **Hypertension of I-II century**
- **Diseases of the urinary system.**
- **Diseases of the digestive system.**
- **Diseases of the respiratory system.**
- **Arthrosis, rheumatic diseases of the joints, periarthrititis.**
- **Venous stasis, lymphedema.**
- **Impotence of functional character.**

Contraindications to the use of impulse currents

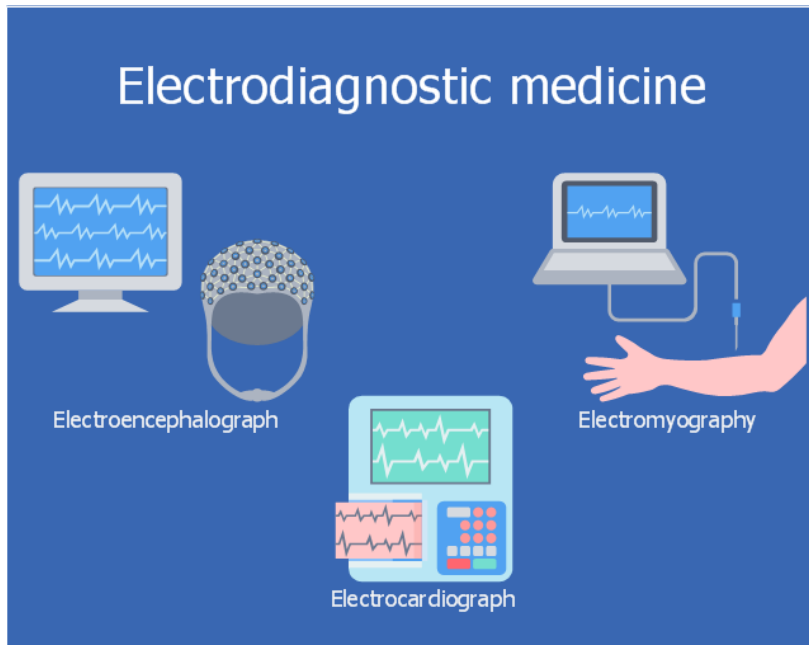
- 1. Common**
- 2. Acute inflammation**
- 3. Fresh fractures, bruises**
- 4. Gallstones, kidney stones (except for the distal location of the calculi)**
- 5. Disease of the media of the eye, retinal detachment**
- 6. Intolerance current**

The main methods of treatment of impulsed currents

1. Electrodiagnostics, electrostimulation of muscles
2. Electric sleep
3. Diadynamic
4. Amplipulse
5. Inductothermy
6. Fluctuating

Electrodiagnostics

-Gives you the ability to determine the functional state of the muscles and nerves of the dose-response effect of electric current.



Electrostimulation

The use of pulsed electrical current for the purpose of arousal or increase activity of individual organs or systems

If a partial reaction of degeneration of nerve stimulation of muscles is carried through the nerve in full - directly through the muscle.

Prescribed only after 4 weeks from the onset of the disease

Indications for electrostimulation

- 1. paresis, paralysis;**
- 2. muscle atrophy after prolonged immobilization (plaster cast);**
- 3. atony of the intestine, uterus, bladder**

Contraindications:

- 1. common**
- 2. spastic condition of the muscles of the skeleton and internal organs**
- 3. hysteria**

Electrosleep

Indications :

- neuroses, neuralgia, encefaliti, the consequences traumatic brain injury, especially with sleep disorders
 - hypertonic disease of I-II century
 - coronary heart disease
 - hypothyroidism
 - diabetes
 - phantom pain
- state after radical surgery in cancer patients



Electrosleep

Contraindications:

- **common**
- **intolerance to a rectangular current**
- **hysteria**
- **skin defects in the field of electrodes**
- **the presence of metal fragments in the brain**
- **eye disease**

Diadynamic

Diadynamic, refers to impulse therapy where used currents of different frequencies applied in different modes

Indications:

- **inflammatory processes in muscles, joints, ligaments, nerves**
- **atony of the intestine**
- **the weakening of the contractile function of muscles**
- **vascular disorders (occlusive disease, Raynaud's syndrome)**
- **pain syndromes (except for contra)**

Diadynamic

Contraindications:

- common
- special to galvanization
- individual intolerance current
- the presence of purulent infection
- bone fractures
- sprains
- hemorrhage
- thrombophlebitis
- renal and gallstones



Amplipulse therapy

The medical usage of alternating sinusoidal modulated current of low power in the pulsed mode.

Advantages :

- ✓ good tolerability of patients**
- ✓ the lack of skin irritation in the area affected**
- ✓ deep tissue penetration**



Thank you for your attention