Gomel state medical University

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High-frequency, ultra-high-frequency and superhigh-frequency therapy. Mechanotherapy, aeroionotherapy.

2021

Signs Common high-frequency therapy:

- ✓ ***First*, the main active factor in all methods of high frequency therapy is considered to be alternating current that is supplied either directly to the body of the patient, or occurs in tissues and fluids of the body is influenced by variable high-frequency fields;**
- ✓ ***Second*, shared is a method for producing active factor. With this purpose, the apparatus uses a resonant circuit;**

Signs Common high-frequency therapy:

- ✓***Thirdly*, similar in many respects and the mechanism of action of these factors on the body. For physiological and therapeutic action of high frequency electrical oscillations is their interaction with electrically charged particles of tissues. It is accompanied by nonspecific (heat) and specific (oscillatory) effects.**

To high-frequency electrotherapeutic methods carry:

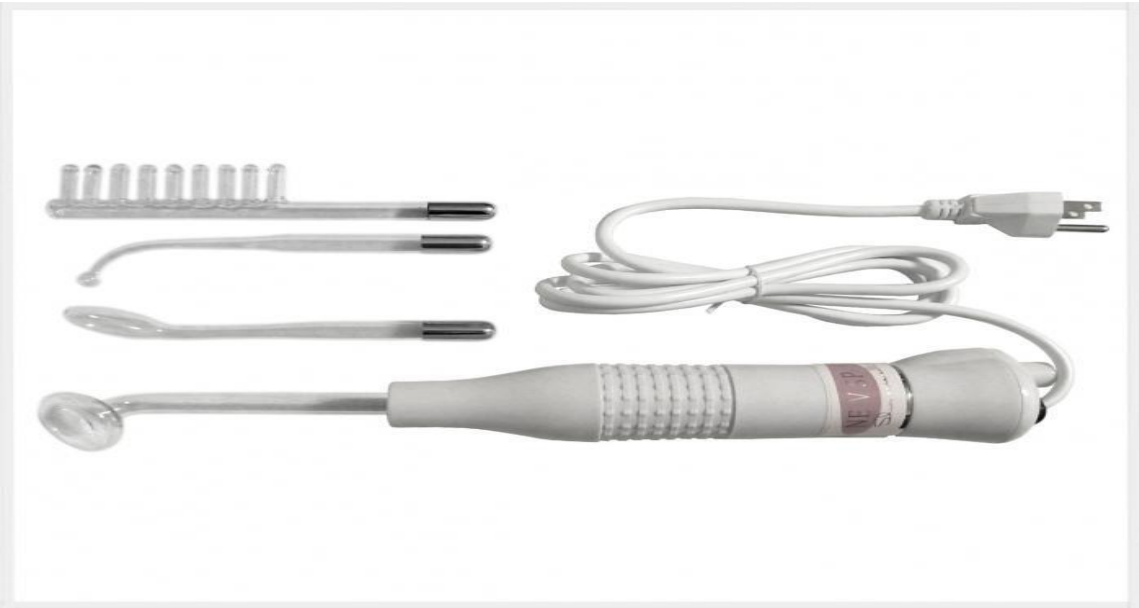
- **local darsonvalization;**
- **Inductothermy;**
- **ultrahigh-frequency therapy;**
- **microwave therapy.**

local darsonvalization

- **therapeutic effect on individual areas of the patient's body weak pulse alternating current of high voltage and medium frequency.**

The main acting factor is:

- **alternating electric current of high frequency (50-110 kHz);**
- **high voltage (25 kV);**
- **low power (0.02 mA);**
- **modulated with short pulses.**

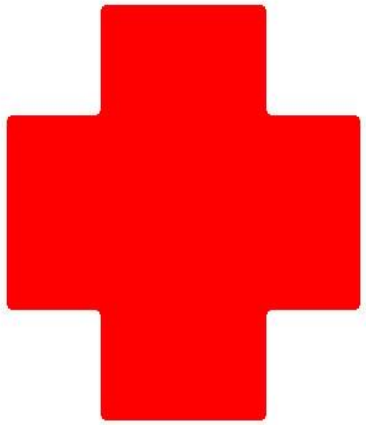


the therapeutic effects:

- ❖ **local analgesic,**
- ❖ **vasoactive,**
- ❖ **local trophic,**
- ❖ **local anti-inflammatory,**
- ❖ **pruritic,**
- ❖ **bactericidal.**

Indications:

- **diseases of the peripheral nervous**
- **sensorineural hearing loss;**
- **neurocirculatory dystonia in cardia**
- **Migraine;**
- **sleep disorders;**
- **climacteric neurosis;**
- **Enuresis;**
- **Alopecia;**



Indications:

- **varicose veins of the lower extremities;**
- **trophic ulcers and skin damage ;**
- **itchy dermatitis;**
- **Eczema;**
- **vasomotor rhinitis;**
- **inflammatory diseases of female genital organs;**
- **Prostatitis.**

contraindications

- **individual intolerance current;**
- **pain with the introduction of the recessed electrodes;**
- **malignant neoplasms;**
- **bleeding and propensity to him;**
- **active tuberculosis;**
- **disorders of skin sensitivity;**
- **cardiovascular insufficiency II and III degree.**

inductothermy

- **(induction — excitation; therme — heat), or high-frequency magnetotherapy — a method based on the effects on the body the magnetic component of electromagnetic field of high frequency. On the body is exposed to an alternating magnetic field frequency of 13.56 MHz.**

Biological effects:

1. **irritation of the nervous system;**
2. **sedative and analgesic effect with prolonged exposure;**
3. **vasodilation, increasing blood and lymph circulation, reduction of blood pressure;**
4. **improvement of blood supply of organs in the affected area**
5. **the increase in the rate of metabolism;**
6. **normalizes the activity of internal organs;**
7. **improves the drainage function of bronchi;**
8. **stimulates the filtration function of the kidneys;**
9. **speeds healing**

Contraindications for inductothermy:

- **feverish condition;**
- **acute purulent-inflammatory diseases;**
- **Bleeding;**
- **active tuberculosis;**
- **Hypotension;**
- **decompensation of cardiovascular activity;**
- **violation of temperature sensitivity;**
- **Pregnancy;**
- **the presence of metal objects and pacemakers in the area of impact;**
- **Tumors.**

ultrasonic therapy

application for therapeutic purposes mechanical vibrations of ultra-high frequency (ultrasound). In physiotherapy practice, ultrasound is mainly used in fixed frequency, preferably in the range from 800 to 3000 kHz and in recent years at a frequency of 22/44 kHz (at least 100 kHz).

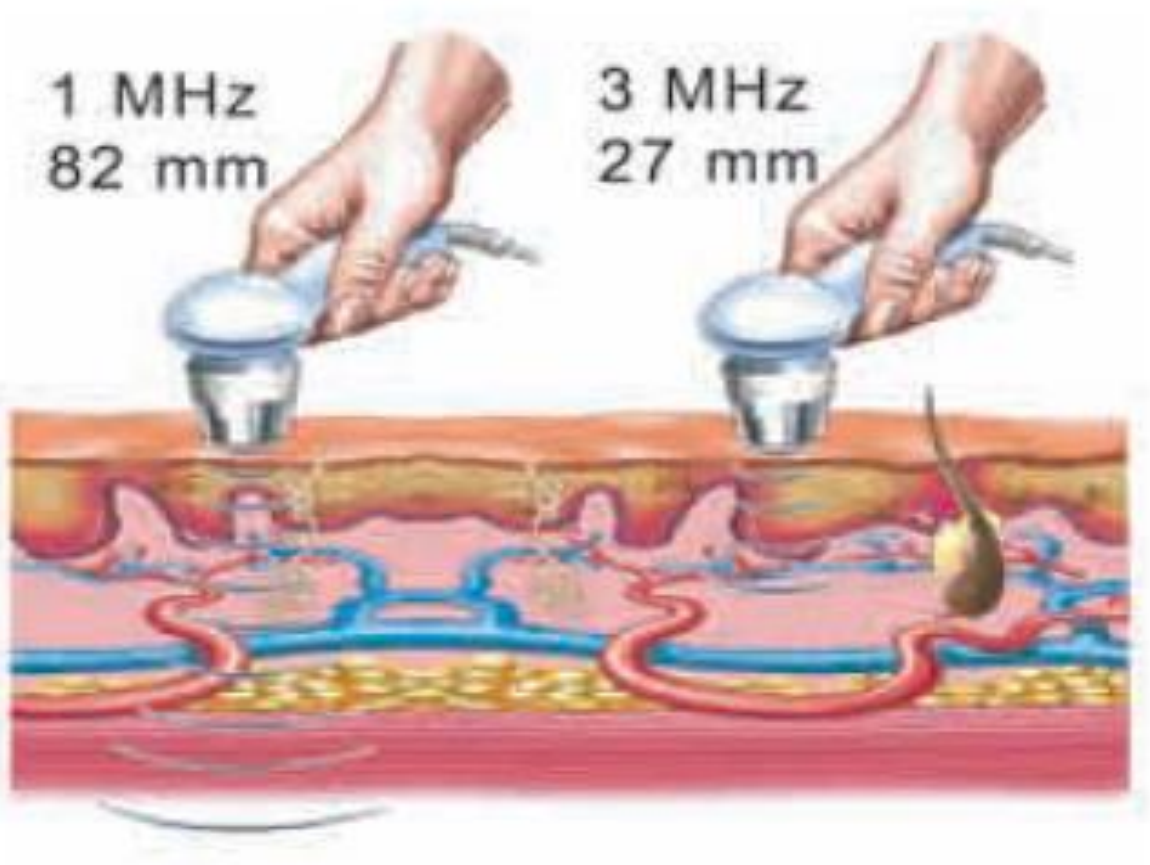
- ***Mechanical factor*** **caused by variable pressure due to the alternating areas of compression and rarefaction of the substance, manifests itself in the vibration of "micromassage" of tissues at cellular and subcellular levels.**

Thermal effect **caused by transformation of the absorbed mechanical energy to heat. Currently, he is given a secondary role. The increase in temperature leads to a change in the activity of enzymes speed biochemical reactions and diffusion processes, improve microcirculation.**

Physico-chemical factor **is manifested in the change of physico-chemical, biochemical, and biophysical processes.**

Therapeutic effects:

- ✓**anti-inflammatory;**
- ✓**Analgesic;**
- ✓**Antispasmodic;**
- ✓**Metabolic;**
- ✓**Defibrotide;**
- ✓**Bactericidal.**



Проникновение ультразвукового поля на частотах 1 и 3 МГц

Indications:

- ✓ **inflammatory and joint disease with severe pain (arthritis, arthrosis, rheumatoid arthritis, osteoarthritis, periarthritis, epicondylitis);**
- ✓ **the consequences of injuries to the musculoskeletal system (contracture, tenosynovitis, etc.);**
- ✓ **inflammatory diseases of the peripheral nerves (neuritis and neuralgia, radiculitis);**

- ✓ diseases of the respiratory system (bronchitis, pleurisy, tuberculosis of the lungs), digestive system (stomach ulcer and duodenal ulcer, biliary dyskinesia);
- ✓ of the genitourinary system (adnexitis, cervical erosion, prostatitis);
- ✓ diseases of the eye, mucous membranes of the oral cavity, scleroderma, trophic ulcers.

Contraindications:

- **coronary heart disease, angina FC III-IV, hypotension, vegetative-vascular dysfunction;**
- **pregnancy in early terms (at irradiation of the lower third of the abdomen);**
- **Thrombophlebitis;**
- **arterial hypertension III degree;**
- **dumping syndrome;**
- **complicated peptic ulcer disease;**
- **acute and chronic purulent inflammatory processes;**
- **pronounced endocrine disorders;**
- **Osteoporosis;**
- **thrombophlebitis.**

Phonophoresis of medicinal substances

the combined effect on the organism of ultrasound and applied to the skin or mucous membranes of the drug substance.

for phonophoresis use:

- **glucocorticoid hormones;**
- **Analgesics;**
- **Antibiotics;**
- **Antispasmodics;**
- **drugs fibrinolytic action.**

indications

- ✓ **in diseases and injuries of the joints**
- ✓ **spinal osteochondrosis with neurological manifestations**
- ✓ **diseases and injuries of the peripheral nervous system**
- ✓ **sports injuries, injuries of the eye**
- ✓ **itching dermatoses**
- ✓ **obliterating diseases of vessels, etc.**

Contraindications for phonophoresis

are individual intolerance

drugs,

as well as contraindications for use of ultrasound

Aeroionotherapy

- **therapeutic and preventive effects on the body of ionized air (air ions)**

Air ions **— a particle of atmospheric air that carry a positive or negative charge and obtained with the use of ionizers or other methods.**

hydroheroine are particles that carry a positive or negative charge resulting from spraying water (gidrokarbonatnaja).

Negative aeroionotherapy **increases the activity of ciliated epithelium of the trachea, pulmonary ventilation, increases the consumption of oxygen and release of carbon dioxide, stimulates the respiratory enzymes. Under the influence of negative ions there is an increase in hemoglobin and red blood cell counts, erythrocyte sedimentation rate slows down and blood coagulation, changes of blood pH in the alkaline side. Blood pressure under the action of negative ions decreases and heart rate slows down. Effect of negative ions modifies the functional state of the Central nervous system, increases the reflex excitability of nerve cells and muscles, strengthens the processes of inhibition in the cerebral cortex**

Positive air ions **cause the body to mostly opposite shifts.**

thank you for your attention