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A methodology that for the first time combines the extensively used magnetic and laser (quantum) therapy and transcutaneous electric neurostimulation is offered for clinical practice.

The book presents information on the mechanism of synergic action of five physical factors used in the RIKTA-ESMIL device: low-intensive coherent pulsed infrared radiation, incoherent red and infrared radiation, the stationary magnetic field and low-intensive pulsating current. The guidelines are given for dosage and different therapeutic regimens using RIKTA-ESMIL, as well as indications and contraindications for it.

Technologies of multifactorial therapy of diseases of visceral organs, the nervous and locomotor systems, dental, ear, nose and throat diseases are presented in detail.

The guidelines are intended for physiotherapists, therapeutists, surgeons and specialists who use medical and non-medical therapy in their practice.

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CONTENTS

Preface..............................................................................................................5

1. Description of the methodology.................................................................7
   1.1. The formula of the methodology.........................................................7
   1.2. Indications and contraindications for use of the methodology.............7
   1.3. Logistics of the methodology...............................................................9
   1.4. The essence of the methodology.......................................................12

2. Conditions of use of the methodology.....................................................18

3. Description of the methodology...............................................................19
   3.1. Circulatory system diseases...............................................................25
   3.2. Respiratory tract diseases.................................................................36
   3.3. Digestive tract diseases.....................................................................41
   3.4. Urinary tract diseases.......................................................................45
   3.5. Central nervous system diseases.......................................................47
   3.6. Peripheral nervous system diseases..................................................49
   3.7. Locomotor system diseases...............................................................54
   3.8. Oral diseases.....................................................................................56
   3.9. Ear, nose and throat diseases............................................................57

4. Effectiveness of the methodology.............................................................58

5. Conclusions...............................................................................................59

6. References...................................................................................................60
PREFACE

One of lingering issues in medicine is the development and adoption of non-medical methodologies that would not only well combine with available pharmacologic treatments of different diseases and enhance their effectiveness, but also would allow tapering the dosage of drugs or even replacing them.

Magnetic and light therapy has been used in medicine since ancient times and permanently perfected. The creation of highly effective semi-conductor infrared pulsed laser emitters in the past decades has helped the advent of laser therapy to almost all fields of clinical practice. Multifactorial therapeutic (quantum) devices have been created that are able of curative effects using several physical factors, in particular devices of the RIKTA family.

Simultaneous effects of electromagnetic fields of different nature (low-intensive coherent pulsed infrared radiation, non-coherent red and infrared ranges, the stationary magnetic field and low-frequency pulsed electric current help therapeutic effects occur at molecular, subcellular, cellular and organic levels.

The combination of multifactorial quantum therapy with transcutaneous electric stimulation in the RIKTA-ESMIL device (2) helps rapid relief of pain and inflammation owing to neurostimulating effects of a specially chosen electric pulses. General (sedative, immunostimulating, hormone-correcting, metabolic) and local (microcirculation-improving, anti-edematous, wound healing and antibacterial) effects of quantum therapy make the devices of the RIKTA series usable in the management of patients with acute...
conditions in combination with conventional drug therapy. Comparative studies of the effectiveness of this combination have persuasively demonstrated enhancement of effects of laser therapy, allowing decreasing drug dosage, the duration of the course of treatment and of the hospital stay of patients, and consequently, offering important psychologic and financial advantages.

In the presence of a chronic disease, in the period of rehabilitation or preventive courses in sport medicine, the RIKTA-ESMIL device is used in combination with minimal doses of drugs or alone (2).

The design of the RIKTA-ESMIL (2) allows physicians using a selective treatment of an affected area, segmental zones, Head areas, trigger zones, and carrying out extravasal irradiation of the circulating blood volume.

A set of special optic tips of the RIKTA-ESMIL device is available for therapy of gynecologic, dental, ear, throat and nose diseases and for reflexive therapy.

Long-term clinical studies indicate that quantum therapy is highly effective in patients with different diseases and of different age.

Several treatment courses can be carried out during a year. The device is simple to operate and safe for patients and medical personnel, and is good for use in an outpatient setting.
1. DESCRIPTION OF THE METHODOLOGY

1.1. The formula of the methodology

The methodology consists in simultaneous use of effects of electromagnetic fields of different nature for achieving a rapid analgesic effect and improvement of microcirculation, regeneration processes and a general stimulating action. Unlike previously available treatments, this modality combines five curative factors and produces a rapid and sustainable reaction of the organism.

1.2. Indications and contraindications for the use of the methodology

*Indications:*

1) Diseases of circulatory system organs: neurocirculatory dystonia, stage 1 and stage 2A essential hypertension, the ischemic heart disease, obliterating atherosclerosis of vessels of extremities, diabetic angiopathy, varicosity of legs and trophic lesions.

2) Respiratory diseases: acute and chronic bronchitis, tracheitis, lobar pneumonia at a resolution stage, bronchial asthma at the stage of a subsiding exacerbation and remission.

3) Central nervous system diseases: neurosis, atherosclerotic, posttraumatic and toxic (alcohol) encephalopathies, peripheral nervous system diseases: neuritis, compressional ischemic, posttraumatic, toxic (alcohol), viral (herpes zoster), endocrine (diabetic) and post-influenza neuropathies and polyneuropathies.
4) Peripheral nervous system diseases: neuritis, neuropathies and polyneuropathies (compressional-ischemic, posttraumatic (alcohol) viral (herpes zoster), endocrine(diabetic), infectious (post-influenza)

5) Digestive tract diseases: chronic gastritis, gastroduodenitis, dyskinesia of the biliary tract, stomach and intestine.

6) Locomotor system diseases: inflammatory, degenerative-dystrophic and traumatic injuries of the spine and joints.

7) Urogenital tract diseases: cystalgia, chronic prostatitis, chronic adnexal inflammation, painful menstruation, mastitis.

8) Ear, nose and throat diseases: acute and chronic rhinitis, maxillary sinusitis, external and median catarrhal otitis, chronic tonsillitis.

9) Oral diseases: parodontitis, paradontosis, temporomandibular arthritis.

10) Diseases of the skin and subcutaneous fat: furunculosis, carbuncles, hydradenitis at the dehydration stage or after discission of a purulent cavity; epithelializing wounds, localized psoriasis (large plaques).

**Contraindications:**

1) Malignant and benign tumors.
2) Systemic blood diseases.
3) Bleedings and vulnerability to them.
4) Acute infectious diseases and febrile conditions.
5) Acute thrombophlebitis (treatment of a thrombus location).
6) Cachexia.
7) Cardiovascular, kidney and liver diseases at a decompensation stage.
8) Heart rhythm disorders (atrial fibrillation, paroxysmal tachycardia).
9) Implant electric pacemaker.
10) Thyrotoxicosis.
11) Convulsions or vulnerability to them.
12) Pregnancy.

1.3. Logistics of the methodology

The RIKTA-ESMIL device (2) (Fig. 1) is intended for electric, light, magnetic and infrared laser therapy that has been designed at MILTA-PKP GITCompany, Moscow.

Technical characteristics

*Therapeutic light regimen:*
- Wavelength, mcm:
  - infrared diode-emitted light .................. 0.860-0.960
  - red diode-emitted light ...................... 0.600-0.700
- Radio frequency, Hz:
  - infrared radiation, permanent frequency .... 5; 50; 1000
  - infrared radiation, "oscillating" frequency ... 250 to 1-2
  - red diode-emitted .................................. 2
- Pulse power, mW:
  - light diode-emitted infrared .............. 120
  - red diode-emitted ............................... 5

*Laser regimen*
- Wavelength, mcm .................................. 0.800-0.910
Frequency, Hz*:
permanent...................................................5; 50; 1,000
alternating "oscillating"...............................250 to 1
Power per pulse, W........................................8 (+6-4)
Exposure to light and laser radiation, min........1; 2; 5; 10
magnetic induction, mTl:
stationary magnetic field...............................35 (+10)

_Electric therapy regimen*
Duration of neurolike pulses, msec..............200
Maximum amplitude of output voltage at inbuilt electrodes, V......................200+50
Maximum current at inbuilt electrodes, mcA........200
Frequency of "packs" of neurolike pulses, Hz......60-120
Duration of exposure..................................manual regulation
Power of the device is from a mains adapter
with output voltage, V........................................9
Weight of the device, kg.................................0.7
Laser safety State Standard R 50723-94...........Class I
Electric safety State Standard R 59267.092..............Protection Class II, BF

* The electrotherapeutic regimen can be used in combination with magnetic, light and laser therapy or alone.
RIKTA-ESMIL device (2)

**Drugs**

1) Drugs, vitamins and plants with antioxidant properties (2% xydiphone solution, succinic acid, vitamins A and E, ginseng, eleutheurococcus tintcure, etc.).
2) Cholagogue drugs (allhol, holagol, etc).
3) Laxatives for constipation
1.4. Essence of the methodology

Treatment can be delivered using the RIKTA-ESMIL (2) device simultaneously with low-energy infrared laser radiation, red and infrared light (incoherent) irradiation with a wavelength close to laser radiation, the stationary magnetic field and low-frequency electric neurostimulation therapy.

All physical factors generated by the device have synergic mechanisms of therapeutic effects that are additive:
- locally in the treated area;
- reflexively on internal organs;
- generalized, acting through the central nervous system;
- mediated humoral and endocrine influences.

Laser radiation is characterized by monochromaticity (set wavelengths), coherence (the radiation phase permanent in time and space), polarization (fixed orientation of electromagnetic field vectors in space). All these properties of the laser act only on superficial skin layers with their receptors, and for this reason it is necessary to use them for treatment of biologically active points of reflexogenic areas, superficial skin areas and the mucosa. A main factor causing a reaction of deeper tissues to laser radiation is monochromaticity and spectral power density. Effects of infrared light with a wavelength corresponding to nearest infrared laser radiation on deeper tissues are equal to those of laser radiation.

The mechanism of therapeutic effects of low-energy infrared diode-emitted light and laser radiation has not been elucidated. It is presumed that light quanta with certain wavelengths are absorbed by acceptor molecules
in tissues, and electrons of a biomolecule can move to higher orbits with greater energy levels, resulting in excitation of biomolecule electrons and their higher reaction ability, which allows them participating in various physical and chemical processes of cellular metabolism.

When electrons return to their orbits, they radiate quanta of energy (secondary radiation). The secondary radiation is not monochromatic, is incoherent, non-polarized and directed in all sides. Secondary radiation quanta excite adjacent biomolecules, and a re-radiation phenomenon occurs, causing an increase in permeability of light and laser radiation. The stationary magnetic field orients molecular dipoles along power lines of the field, markedly reducing absorption by biologic tissue of electromagnetic oscillations of visible and nearest infrared, thereby increasing the depth of light and laser penetration of tissues. The transfer of laser excitation of biomolecules also can occur as non-radiation exchange between electron-excited molecules (photo donors) and molecules in a basic condition (photo acceptors) by so-called inductive resonance and exchange resonance mechanisms.

The interaction of laser radiation with biologic molecules most often occurs on cell membranes, which results in a non-specific reaction of cells of the irradiated tissue: change in the superficial charge of cells and their dielectric permeability, enhancement of enzyme and metabolic processes, tissue oxygen uptake, bioenergetic and biosynthetic processes.

Activation of these processes stimulates protein and nucleic acid synthesis, glycolysis, lipolysis and oxidative phosphorylation of cells. The activation of regenerative
processes and accumulation of macrophages lead to a higher oxygen uptake and intracellular oxidation of organic substances, i.e. to improvement of nutrition of irradiated tissues. Vessel dilation normalizes the local blood flow, with dehydration of the inflammatory site, and stimulates tissue repair and the depositary activity of neutrophils.

Conformational changes of proteins modify the potential of dependent ion channels of the neurolemma of skin afferents, and for this reason laser radiation with a great frequency (1000 Hz) causes depression of tactile sensitivity. The reduction of the pulse activity of nerve ends of C afferents from a pain focus alleviates pain. Apart from local reactions, afferent pulses from skin and muscle nerve receptors forms through segmental-metamer links the reactions of internal organs and surrounding tissues, as well as generalized reactions of the body: activation of internal secretion glands, cell-mediated and systemic immunity, the opioid system and repair processes. Irradiation of the circulating blood volume activates the erythrocyte enzyme system, which causes an increase in blood oxygen capacity, a substantial decrease in the platelet aggregation rate, improvement of microcirculation of blood and lymph without change of coagulation and bleeding time.

Transcutaneous electric neurostimulation is a method of treatment of skin receptors, biologically active points and afferent conductors with currents of low intensity and frequencies that are neurolike in form, duration and the pulse rate. A pulse is perceived by the organism as its own, and for this reason all types of sensory nerve fibers are excited. Transcutaneous electric neurostimulation is radically differ-
ent from electric stimulation of the neuromuscular system, as it does not stimulate motor fibers and thus does not cause muscle contractions. A maximum effect is concentrated on sensory afferent fibers with a high nerve pulse conduction rate, which blocks pain pulses from an affected site through spinal mechanisms. Activation of neurons of anti-pain structures is accompanied by stimulation of the supraspinal system and release by brain structures, digestive organs and endocrine glands of endorphines, which are substances that inhibit pain pulses. Alleviation of acute pain and, in a lesser degree of chronic pain, is seen during the treatment session and keeps for 1-4 hours after it. The pain-relieving and antiinflammatory effects are significantly enhanced owing to combined action of electric neurostimulation, light, laser and magnetic treatment. If the procedures using the RIKTA-ESMIL (2) are repeated, the pain syndrome and inflammation are reduced in a short time.

Apart from analgesia occurring during the treatment session, the combined use of the device's physical factors produces prominent vasoactive effects, activating circulation in ischemic tissues, metabolic and trophic processes in a treated area and deeper tissues that are segmentally related with corresponding skin segments. Owing to topical, segmental and general reactions of the organism, synchronization of relations of all of its regulatory systems is achieved. The stimulating pulses have a regulating effect on the organism, mobilize reserve functional elements of tissues, restore impaired functions and facilitate the recruitment of humoral and immune mechanisms, reestablish lost relations between affected areas and all controlling systems of the body.
Therapeutic effects of electric-, light-, magnetic-, infrared laser therapy

1. Analgesic, in the presence of inflammatory diseases and traumas. The mechanism of pain relief is complex: pain pulses from the inflammatory site are blocked through spinal and central mechanisms, production of neurohormones (in particular endorphins) is increased, and effects are exerted on pathogenetic mechanisms causing pain by inducing resorption of hemorrhages after trauma, inflammatory infiltration, etc.

2. Anti-edematous, due to an increase in the diameter of venules and of the venous outflow and lymph flow (lymph drainage).

3. Anti-inflammatory, due to improvement of circulation at the inflammatory site and a strong increase in numbers of blood cell elements that are engaged in phagocytosis, an increase in the venous outflow from an inflammatory site, which helps elimination of toxins of viruses and bacteria and of degradation products from intercellular tissues; cell-mediated and systemic immunity is stimulated.

4. Vascular. The therapy improves tone of arteries through the vegetative nervous system: tone of spastic vessels is decreased and of atonic vessels increased, which stimulates the blood flow in terminal vessels, abolishes edema and improves microcirculation.

5. Relaxing (antispastic) effects on smooth and skeletal muscles.

6. Anti-allergic - stimulation of production by cells of substances that decrease hypersensitivity of the organism to food allergens and other allergens.
7. Immunomodulating, in the presence of impairment of nonspecific immunity and systemic and cellular immunodeficiency in patients with frequent bronchitis, pneumonia or throat angina) the immune function is modulated.

8. Lipid, protein and mineral metabolism is normalized in patients with obesity, atherosclerosis, gout and joint diseases.

9. The hormonal status is normalized - for instance, of endocrine secretion in patients with bronchial asthma, diabetes mellitus, secondary infertility and chronic prostatitis.

10. Wound healing stimulation in the presence of trophic lesions, long unhealing wounds and erosions.

11. Resorptive (defibrotic) effects on the fresh scar tissue after traumas, burns and surgical operations.

12. Cosmetic - improvement of tone, hemodynamics and nutrition of the facial skin, allowing correction of the problem skin.
2. CONDITIONS OF USING THE METHOD

The method of electric-, light-, magnetic-, infrared laser therapy using RIKTA-ESMIL(2) does not require a specially equipped room.

Specialists carrying out this therapy must have medical education and a certificate of training in laser therapy.

Safety of the method. Low-energy infrared laser radiation and of incoherent infrared and red radiation does not require the use of protective spectacles by medical staff and patients.

The RIKTA-ESMIL (2) device has Class1 laser safety according to State Standard R50723-94.

Electric safety: according to State Standard R502670-92. Protection Class 11, BF.
3. DESCRIPTION OF THE METHODOLOGY

Methodology

Depending on what area is affected, the treatment procedure can be stable (the emitter electrode is held immovably on the area), steadily scanning (stable on a painful area), stable scanning (on an area of irradiated pain) and scanning (gradual to and fro movement of the emitter electrode over an extensive affected area) during the whole procedure). Electric pulsed therapy is applied only to the dry skin. Scanning light and laser radiation can be delivered through gauze dressings, but radiation power is decreased two times. The emitter electrode is put in contact with the skin. In some cases, the treatment is contact-distant (for example, the treatment of an extensive wound surface with light and laser radiation is distant and of adjacent tissues contact) and in some cases it is distant (for example, treatment of the mouth mucosa). The technique of vaginal or rectal light and laser irradiation can be used. For this, an optic tip made of transparent organic glass is screwed on the emitter, a condome is put on it and greased with vaseline oil, and the tip is inserted into the vagina or the rectum.

Areas of treatment

a) Direct treatment of an affected skin or mucosal area (for example, furuncles, carbuncles, hydradenitis, wounds, trophic lesions or herpes zoster). All curative factors and the scanning technique are used for chronic tonsillitis and cervical erosions; light and laser radiation is applied using the stable technique.
b) Direct treatment of a projection of an affected organ using magnetic, light and laser radiation and the reflexive treatment using electric stimulation (of maxillary sinuses, joints, the liver, the pancreas, the intestine, uterine adnexae, etc.) The treatment technique is scanning.

c) Segmental (metamer) areas of the treatment of cervical, thoracic, lumbar, sacral and coccygeal segments of the spine. The treatment of skin areas that are segmentally (metamerically) related to visceral organs and tissues can change their function after RIKTA-ESMIL treatment. The therapy is delivered using all physical factors generated by the device. The treatment technique is scanning.

d) Specific areas of treatment using all factors of the RIKTA-ESMIL device (2) are Head zones (zones of skin tenderness of a variable size and shape that often do not coincide with the territory of sensory innervation).

Trigger zones. Exteroceptive trigger zones clinically present as localized painful skin indurations, local vaso-motor disorders of sweating and thermoregulation, reddening or pallor of skin areas, abnormal pigmentation and change of electric skin resistance (impedance). Proprioceptive muscle trigger zones clinically present as painful muscle indurations of different shape, size and locations. Pain of variable severity occurs spontaneously after movement or palpation. Severe pain sometimes causes loss of function of an organ or a part of the body. There may be connective tissue trigger stiffness of fascia, ligaments or the periosteum.

Interoceptive receptors. Visceral trigger points are difficult to find. They most often occur as viscero-dermal and viscero-motor manifestations (in skin, muscle, fascial and
Head zones). All physical factors generated by the device are used, but electric neurostimulation is the most important. The scanning treatment technique is used.

e) Areas of general regulatory treatment: the hormonal state (adrenal, ovarian, testicular, prostatic areas; anti-allergic zones (adrenal glands, the pancreas, the intestine, the 7th cervical vertebra and biologically active points. All physical factors generated by the device are used simultaneously using the scanning technique.

f) Magnetic, light and laser extravasal irradiation of circulating blood over major arteries and veins. The stable treatment technique is used.

**Radiation frequency**

The frequency of pulsed radiation of red light-emitting diodes is permanent - 2 Hz. Red radiation has effects only on superficial layers of the skin and mucosa, and is used for stimulation of regeneration of the affected skin and mucosa.

Infrared light diode and infrared laser radiation are coordinated in permanent frequencies (5, 50 and 1000 Hz) and in gradually changing frequencies (250 to 1 Hz). Since the frequencies are coordinated, light and infrared laser radiation treatments are additive. The 5 Hz frequency is most often used for treatment of visceral diseases, the endocrine system and extensive wound surfaces at the stage of reparative regeneration. Frequencies of electric potentials of viscera are similar to frequencies of light and laser radiation of RIKTA-ESMIL (e.g. the frequency of natural electric potential of the stomach is 4,0-4,6 Hz). The permanent frequency (50 Hz) and "oscillating" frequency
(1 to 250 Hz) are used for the treatment of biologically active points, intero- and proprioceptors for influencing function of internal organs and systems of the organism as a whole.

The permanent 1000 Hz frequency has an inhibitory effect on organ function, including antiinflammatory effects occurring as significant improvement of local microcirculation.

The frequency of low-intensive pulsed electric stimulation is not set. The frequency of stack pulses changes automatically.

**Pulse power**

Pulse power of red light diode-emitted radiation is 5 mW, of pulsed diode infrared radiation 120 mW and of pulsed infrared laser radiation 8 W. The latter can be changed in different devices from 4 to 14 W per pulse. Infrared laser pulse power of RIKTA-ESMIL (2) is not changeable.

The stationary magnetic field has permanent magnetic induction (35 mTl), and it is useful when it is delivered with a contact technique. The magnetic field has very low intensities when it is applied from a distance.

The intensity of electric pulse therapy is regulated manually from minimum to maximum values. The maximum amplitude of positive and negative components of a neuro-like pulse is 200±50 V, but the negative component can decline to zero during the treatment. It has a prominent stimulating, but not cauterizing effect on peripheral skin receptors.

**Minimal intensity** of electric stimulation therapy. After the device is turned on, regulation buttons are pressed for
selecting a voltage that is felt by the patient as a slight pin sensation under electrodes. The device must not be moved when this dosage regimen is used. This mode is used for treatment of biologically active points (areas), trigger points (areas) and of children with the prominent pain syndrome.

**Optimal intensity** of electric pulsed stimulation therapy. After turning on the device, a voltage is chosen using regulation buttons until a specific sound under the electrode is heard during scanning. This technique is used for both stable and scanning treatment of localized affected areas and trigger zones.

**Maximal intensity** of electric stimulation therapy. When electrodes of the device are applied to the skin, the patient has a marked pin sensation and feels vibration. These sensations decrease during scanning, and current may be increased, but without causing pain of the patient. A specific sound is heard from under the electrode, and there is resistance to the movement of the electrode on the skin. This technique is used to treat extensive affected areas and at the stage of regression of acute pain or in the presence of moderate pain.

**Therapeutic dose**

The therapeutic dose is a sum of power (intensity) of a physical factor and the duration of the procedure. The calculation of a therapeutic dose of infrared laser radiation is crucially important, as its effects are enhanced by infrared light diode-emitted radiation. It is known from the literature that laser radiation power must not be above 4 J per sq.cm if damage of tissues is to be avoided [2], and summary
laser energy must not exceed 5 J [4]. Power of the RIKTA-ESMIL device (2) is 1,600 mJ/sq.cm (1.6 J/sq.cm) at maximum frequency of 1,000 Hz during a ten-minute treatment session. Thus 10-15 minutes of treatment using infrared, light and laser radiation will be an optimal therapeutic dose. When more than 10 minutes of treatment are necessary, the timer is turned on repeatedly.

An average duration of electric neurostimulation of a minimal intensity may be 30 min, of an optimal intensity 20 min and of maximal intensity 15 min. Electric neurostimulation continues after the magnetic, light and laser treatment ends. When necessary, electric neurostimulation is repeated two-three times a day. An optimal course of therapy using RIKTA-ESMIL (2) includes 10-12 procedures.
### 3.1. Diseases of the circulatory system

**Ischemic heart disease and cardiac-type neurocirculatory dystonia**

<table>
<thead>
<tr>
<th>Area of treatment</th>
<th>Technique</th>
<th>Parameters</th>
<th></th>
<th></th>
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<td></td>
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<td>Frequency, Hz</td>
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<td>Regimen</td>
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<td>5</td>
<td>Optimal</td>
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<tr>
<td>Apex</td>
<td>Stable</td>
<td>5</td>
<td>5</td>
<td>Minimal</td>
</tr>
</tbody>
</table>

Course of therapy: 8-10 daily procedures.
Fig. 2. Paravertebral area

Fig. 3. Sternal area
Fig. 4. Apex area

**Essential hypertension and hypertensive-type neurocirculatory dystonia**

<table>
<thead>
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<th>Technique</th>
<th>Parameters</th>
<th>Quantum therapy</th>
<th>Electric therapy</th>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Frequency, Hz</td>
<td>Time, min</td>
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<td>Scanning</td>
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<td>Shoulder area, posterior</td>
<td>Scanning, from the head to shoulders</td>
<td>50</td>
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</table>

Course of therapy: 10-12 daily procedures.
Fig. 5. Paravertebral area of the cervical spine

Fig. 6. Shoulder area (arrows show scanning directions)
Obliterating sclerosis of leg vessels

<table>
<thead>
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<th>Technique</th>
<th>Parameters</th>
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<td></td>
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<tr>
<td>Popliteal pit</td>
<td>Stable</td>
<td>1000</td>
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<td>None</td>
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<tr>
<td>Sural muscles</td>
<td>Scanning</td>
<td>1000</td>
<td>5</td>
<td>Minimal</td>
</tr>
</tbody>
</table>

Course of therapy: 10-12 daily procedures.

Fig. 7. The area of the inguinal ligament, bilaterally
Fig. 8. The popliteal area, bilaterally
Fig. 9. The sural area, bilaterally
**Diabetic angiopathy of legs and varicosity complicated by trophic lesions**

<table>
<thead>
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<th>Parameters</th>
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<th>Electric therapy</th>
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<td>Trophic lesion*</td>
<td>Scanning</td>
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<td>Alternate</td>
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</tr>
</tbody>
</table>

* The trophic lesion is scanned with a distant technique in the direction of adjacent normal tissues toward the centre of the lesion. The therapy of the trophic lesion begins after 3-5 treatments of leg vessels.

Course of therapy: 15 daily procedures.
Fig. 10. Inguinal ligament, bilaterally
Fig. 11. Popliteal pit, bilaterally
Fig. 12. Feet, bilaterally

Fig. 13. Trophic lesion
### 3.2. Respiratory tract diseases

**Acute and chronic tracheitis, bronchitis, chronic obstructive bronchitis**

<table>
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<th>Technique</th>
<th>Parameters</th>
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<td></td>
<td></td>
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<td><strong>Time, min</strong></td>
<td><strong>Regimen</strong></td>
<td><strong>Time, min</strong></td>
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<tr>
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<td>Scanning</td>
<td>1000</td>
<td>5</td>
<td>Optimal</td>
<td>15</td>
</tr>
<tr>
<td>Sternum</td>
<td>Scanning</td>
<td>5</td>
<td>5</td>
<td>Minimal</td>
<td>15</td>
</tr>
</tbody>
</table>

Course of therapy: 10 daily procedures.

*Fig. 14. Paravertebral area of the thoracic spine*
Fig. 15. Treatment of the sternal area
**Lobar pneumonia at a resolution stage**

<table>
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<tr>
<th>Area of treatment</th>
<th>Technique</th>
<th>Parameters</th>
<th>Quantum therapy</th>
<th>Electric therapy</th>
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<td></td>
<td></td>
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<td>Regimen</td>
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<td>Optimal</td>
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Course of therapy: 10-12 procedures.

**Fig.16.** Paravertebral area of the thoracic spine, bilaterally

**Fig. 17.** The affected lung area
### Bronchial asthma at a subsiding exacerbation stage

<table>
<thead>
<tr>
<th>Area of treatment</th>
<th>Technique</th>
<th>Parameters</th>
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<td></td>
<td></td>
<td>Frequency, Hz</td>
<td>Time, min</td>
<td>Regimen</td>
</tr>
<tr>
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<td>Scanning</td>
<td>Alternate</td>
<td>5</td>
<td>Optimal</td>
</tr>
<tr>
<td>Adrenal area</td>
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<td>Alternate</td>
<td>5</td>
<td>Optimal</td>
</tr>
<tr>
<td>Supraclavicular</td>
<td>Scanning</td>
<td>Alternate</td>
<td>5</td>
<td>Minimal</td>
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</tbody>
</table>

Course of therapy: 10-12 daily procedures.

**Fig. 18.** Paravertebral area of the thoracic spine, bilateral
Fig. 19. Adrenal areas, bilateral

Fig. 20. Supraclavicular areas, bilateral
3.3. Digestive tract diseases

Acute and chronic inflammatory diseases (gastritis, duodenitis, cholecystitis, colitis)

<table>
<thead>
<tr>
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<th>Technique</th>
<th>Parameters</th>
<th>Quantum therapy</th>
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<td></td>
<td></td>
<td>Frequency, Hz</td>
<td>Time, min</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Regimen</td>
<td>Time, min</td>
</tr>
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<td>Paravertebral, lower thoracic spine</td>
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<td>Alternate*</td>
<td>5</td>
<td>Optimal</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Paravertebral, upper lumbar</td>
<td>Scanning</td>
<td>Alternate*</td>
<td>5</td>
<td>Optimal</td>
</tr>
<tr>
<td></td>
<td></td>
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<tr>
<td>Area of organ projection</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>15</td>
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</tr>
</tbody>
</table>

*The alternating frequency is used during preventive courses in the remission period. The frequency 1000 Hz is used during an exacerbation period.

Course of therapy: 10-12 daily procedures.

Fig. 21. Paravertebral area, lower thoracic spine, bilaterally
Fig. 22. Paravertebral area, upper lumbar spine, bilaterally

Fig. 23. Stomach and duodenal areas
Fig. 24. Liver area

Fig. 25. Gallbladder area
Fig. 26. Pancreatic area

Fig. 27. Large intestinal area
### 3.4. Urogenital tract diseases

**Chronic adnexitis. Chronic prostatitis.**

<table>
<thead>
<tr>
<th>Area of treatment</th>
<th>Technique</th>
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<td>Iliac area</td>
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</table>

Course of therapy: 10-12 daily procedures.

**Fig. 28.** Area of treatment of adnexitis  
**Fig. 29.** Area of treatment of prostatitis
Fig. 30. Iliac area, bilateral treatment

Fig. 31. Perineal area
### 3.5. Central nervous system diseases

**Neurosis-like diseases and encephalopathies of different genesis**

<table>
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<th>Area of treatment</th>
<th>Technique</th>
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<td>Frequency, Hz</td>
<td>Time, min</td>
<td>Regimen</td>
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<tr>
<td>Carotid triangle, bilateral</td>
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<td>-</td>
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<tr>
<td>treatment</td>
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</tbody>
</table>

A course of electric therapy is delivered in 5-6 hours.

<table>
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<th>Area of treatment</th>
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<td>Shoulder area</td>
<td>Scanning</td>
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<td>-</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Optimal</td>
</tr>
</tbody>
</table>

Course of therapy: 15 daily procedures.

*Fig. 32. Treatment of carotid arteries (the carotid triangle)*
Fig. 33. Shoulder area
### 3.6. Peripheral nervous system diseases

**Trigeminal, occipital and facial neuritis**

<table>
<thead>
<tr>
<th>Area of treatment</th>
<th>Technique</th>
<th>Parameters</th>
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<tbody>
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<tr>
<td>Nerve exit point</td>
<td>Stable, contact</td>
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</table>

Course of therapy: 10 daily procedures.

**Fig.34.** Treatment of the trigeminal nerve
Fig. 35. Treatment of the occipital nerve

Fig. 36. Treatment of the facial nerve
### Neuropathy

<table>
<thead>
<tr>
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<th>Technique</th>
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<tr>
<td></td>
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<td>Along an affected nerve</td>
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<td>Skin innervation area</td>
<td>Scanning</td>
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<td>15-20</td>
<td>15-20</td>
</tr>
</tbody>
</table>

* The frequency used during an acute period of the disease is 1000 Hz. A variable regimen from 250 to 1 Hz is used later for stimulation of regeneration of an affected nerve.

** A maximum regimen of electric therapy is used for severe pain (herpes zoster) 2-3 times a day.

Course of therapy: 10-15 days.

Fig. 37. Treatment of the radial nerve
Fig. 38. Treatment of the ulnar nerve

Fig. 39. Treatment of the sciatic nerve
Fig. 40. Treatment of the tibial nerve

Fig. 41. Treatment of intercostal nerves
3.7. Locomotor system diseases

Acute inflammatory diseases of the spine and joints (osteochondrosis with neurologic symptoms, Bekhterev's disease with severe pain. Arthritis, mixed arthritis at an exacerbation stage), posttraumatic joint and soft tissue hemorrhage).

<table>
<thead>
<tr>
<th>Area of treatment</th>
<th>Technique</th>
<th>Parameters</th>
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<tbody>
<tr>
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<tr>
<td></td>
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<td>Time, min</td>
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<tr>
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<td></td>
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<td></td>
<td></td>
<td>15-20</td>
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</tbody>
</table>

* Alternating frequency (250-1 Hz) of quantum therapy and maximum intensity electric stimulation are used for degenerative-dystrophic spinal and joint diseases at a remission stage.

Course of therapy: 10 procedures.

Fig. 42. Treatment of spinal osteochondrosis
Fig. 43. Treatment of the hip joint, knee and ankle
3.8. Oral diseases

**Parodontitis, alveolitis, temporomandibular arthritis***

<table>
<thead>
<tr>
<th>Area of treatment</th>
<th>Technique</th>
<th>Parameters</th>
<th>Quantum therapy</th>
<th>Electric therapy</th>
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<td>Frequency, Hz</td>
<td>Time, min</td>
<td>Regimen</td>
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<tr>
<td>Mandible</td>
<td>Stable, contact**</td>
<td>1000*</td>
<td>10</td>
<td>-</td>
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</tbody>
</table>

* Electric therapy of temporomandibular arthritis is conducted simultaneously with quantum therapy. Time: 10 min.
** An optic tip is used for treatment of parodontitis

Course of therapy: 8-10 daily procedures.

**Paradontosis**

<table>
<thead>
<tr>
<th>Area of treatment</th>
<th>Technique</th>
<th>Parameters</th>
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<th>Electric therapy</th>
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<tr>
<td>Area of paradigm</td>
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<td>Alternating</td>
<td>10</td>
<td>-</td>
</tr>
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</table>

* An optic tip is used during the treatment of paradontosis.

Course of therapy: 8-10 daily procedures.
3.9. Ear, nose and throat diseases

**Acute, chronic, vasomotor, allergic rhinitis, catarrhal otitis, maxillary sinusitis**

<table>
<thead>
<tr>
<th>Area of treatment</th>
<th>Technique</th>
<th>Parameters</th>
<th>Quantum therapy</th>
<th>Electric therapy</th>
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<td>Frequency, Hz</td>
<td>Time, min</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Time, min</td>
<td>Regimen</td>
</tr>
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<td>Accessory sinuses of the</td>
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<td>10</td>
<td>Minimal</td>
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<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>Submandibular</td>
<td>Stable, contact</td>
<td>1000</td>
<td>5</td>
<td>Minimal</td>
</tr>
</tbody>
</table>

Course of therapy: 10 daily procedures.

**Fig. 44.** Treatment of the nose and accessory sinuses of the nose
4. EFFECTIVENESS OF THE METHODOLOGY

The treatment of 68 patients with osteochondrosis (24 patients), polyneuropathies (21) and arthrosis (23) has been carried out in the 29th Municipal Hospital. The age of the patients ranged from 28 to 71 years. The scanning technique of multifactorial quantum therapy was used in patients with spinal osteochondrosis, and combined electric, light, magnetic and infrared laser therapy in patients with the acute pain syndrome. A good response to a course of therapy consisting of 10-12 procedures was seen in 82% and a satisfactory response in 18% of the patients. All patients tolerated the procedures well.

Pain significantly subsided in the middle of the course (after 3-5 treatment sessions) and was absent by the end of therapy. The range of joint movement increased. Therapy of acute radiculitis reversed the myofascial syndrome. Combined electric, light, magnetic and infrared laser therapy of radicular syndromes and polyneuropathies produced better results as compared to quantum therapy alone.
5. CONCLUSIONS

1. Combined electric, light, magnetic and infrared laser therapy using the RIKTA-ESMIL device (2) is effective for inflammatory and degenerative-dystrophic diseases, several diseases of the central and peripheral nervous systems and the locomotor system.

2. The RIKTA-ESMIL device (2) has a good design, is simple and convenient to use and safe for patients and medical personnel. It can be used both in an inpatient and outpatient setting.
6. REFERENCES

1. Bogolyubov V.M. Resort medicine and physiotherapy; 2 volumes, Moscow, Meditsina, 1985