# METHODICAL RECOMMENDATIONS

**for "POLYMAG-01" magneto-therapy device application**

ELAMED, 2011

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These methodical recommendations are intended for physiotherapists, therapists, surgeons and other specialists applying magneto-therapy in their medical practice.
In methodical recommendations there are given detailed physio-therapeutic technique for application of the device to treat various diseases.

## 1. Procedure description.

### 1.1. Device destination.

Polymag-01 device is designed to be used for therapy with low-frequency, low-intensive magnetic field such illness as: acute and chronic cardiovascular diseases, diseases of bronchopulmonary, nervous, loco-motor systems, urogenital system, endocrine system, inner organs, soft tissue infections, immuno-dysfunction, traumatic injury and its complications.

### 1.2. "Polymag -01" device technical characteristics.

The device consists of centralized control microprocessor block and emitters of two types. The basic emitters contain "flexible" emitting surface consisting of 4 flexible emitting strip-lines of 6 inductors each and microprocessor control unit. The device can comprise 2-4 basic emitters. Replaceable (additional) emitter includes flexible emitting strips of 6 inductors. (Fig.1) All inductors are marked from two sides: one side is marked with mark "N" (north), the other- "S" (south). While making procedure it is necessary to take into account the possibility to take magneto-therapy with different magnetic poles.

Replaceable (additional) emitters control microprocessor system is one of the components of the block of the centralized control. All emitters are connected to centralized control block with flexible cables with the help of split type connection.

- Electric power is supplied from a.c. mains, frequency 50 Hz, circuit voltage (220 ±22) V.
- Power consumption of the device, max. 350 VA.
- Device provides generation of low- frequency, low-intensive pulsed magnetic fields of different types in continuous and discontinuous modes of run. Types of magnetic fields generated by device:

a) continuous ("fixed") pulsating magnetic field;
b) discontinuous pulsating magnetic field;
c) "traveling" in vertical plane top down or bottom up direction;
d) both "traveling" in horizontal plane or rotating magnetic field in the direction from right to left or from left to right;
e) diagonal "traveling". There is made effect of simultaneous action with a traveling magnetic field in horizontal and vertical planes.

Amplitude of magnetic induction on the inductors surface:

- in the mode of "travelling field" generation - 2,4,6,8,10,15,20 mTl with field pulses frequency from 1 to 100 Hz and 25 with frequency from 1 to 75 Hz.
- in the mode of "fixed" field generation – 2,4,6 mTl with magnetic field pulses frequency from 1 to 16 Hz
- magnetic exposure (action) procedure time , min - 5,10,15, 20, 25, 30.
- pulse action duration and pause between them in the mode of discontinuous magnetic field, s, - from 1 to 60 with resolution 1s.
- magnetic field pulses frequency, Hz. - from 1 to 100 with discrecity (resolution) 1 Hz .
- emitters surface temperature, ° C – less than 40.
- device provides the possibility of setting and indication of the following parameters:
  - field configuration,
  - value of magnetic induction,
  - frequency,
  - exposure time,

Device appearance, fig. 1

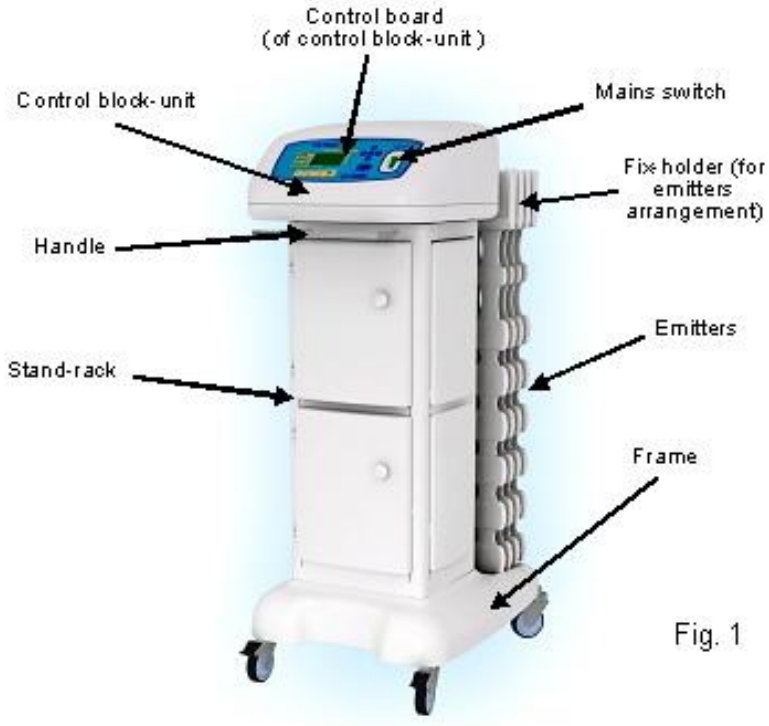


Fig. 1

- direction of pulsed magnetic field traveling in the area.
- device provides the possibility of creation, storage and execution of set parameters different programs:
- exposure (action) mode – discontinuous and continuous.
- device enables the possibility to operate from external synchronization source unit and together with electronic computer. Synchro-pulses parameters : duration, min .- 0,1 ms, amplitude- from 3,0 to 5,0 V
- Time of operating mode setting, min., - 30 sec.
- Time of continuous run, min 8 hours with the cyclic mode:
30 min. - magnetic action (exposure), 10 min. - break.
- The mean life time of the device, min. - 5 years.
- Outward surfaces of device component parts are stable to disinfection by chemical method.
Electric safety of the device is Class 2 of BF type.

**1.3. Essence of method**

"Polymag-01" device generates the following types of low frequency pulsed magnetic field.

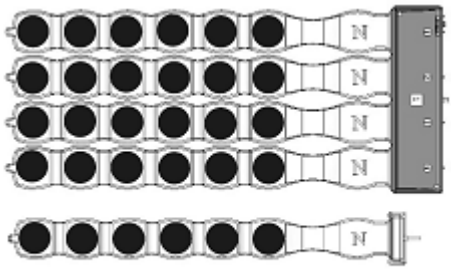

Fig. 2

- "Fixed" pulsating magnetic field (fig.2) With this type of magnetic field all inductors in the basic and replaceable (additional) emitters with the specified frequency (from 1 to 16 Hz) are being activated at the same time, simultaneously there is the action of pulsating, pulsed magnetic field of 6 mTl on the vast areas of patient body.

- "Discontinuous" pulsating magnetic field. Magnetic field is interrupted uniformly in order to intensify stimulating effect of "fixed" pulsating magnetic field with selected low frequency pulsating magnetic field (1-16 Hz.). Duration of pause sending is from 1 s. to 60 s. with discrecity (resolution) 1 s. Intensity of magnetic induction is up to 6 mTl.

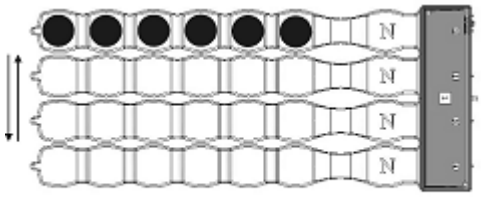

Fig. 3

- " traveling" magnetic field in the vertical plane top down or bottom up toward the patient body axis. (fig.3). With magnetic field intensity up to 20 mTl frequency of magnetic pulses may be set from 1-100 Hz., with intensity 25 mTl. pulses frequency is limited up to 75 Hz. With the given type of magnetic field all inductors in the top and bottom strip - line (depending on the direction of magnetic field traveling) are activated simultaneously then all inductors in underlying or overlying strip-line are activated and so on.

With this type of magnetic field the alternating action on arterial, venous and lymphatic systems vascular wall is supposed to be done so that the magnetic pulses promote the flow of both blood, lymph through the vessels.
- "traveling" magnetic field in horizontal l plane (or traveling horizontal") towards the patient body axis (Fig. 4).

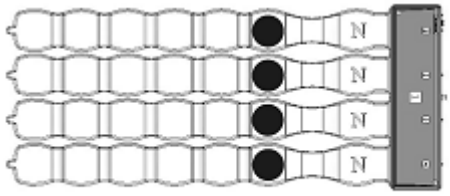


Fig. 4

With this type of magnetic field all first inductors in all basic emitters are activated at the same time. All second inductors in all lines are activated with the specified frequency and so on – magnetic field is traveling in horizontal direction. If we join the end of strip-lines of basic emitter so that to make solenoid, "traveling horizontal" of magnetic field can generate rotating magnetic field around patient body or his extremities in right-or- left direction rotation mode. Frequency of given magnetic field is from 1 to 100 Hz, intensity of magnetic induction amplitude is from 2 to 20 mTl. Long-time practice of " Magneto-turbotron" device (generating pulsed right-rotating type magnetic fields with frequency 100 Hz. and magnetic induction intensity up to 2 mTl.) application shows method high efficiency at immunodeficiency state treatment , when after taken course of magneto-therapy treatment , the values of cell immunity rates (T – lymphocytes) and later the values of humoral immunity are being up to normal level.

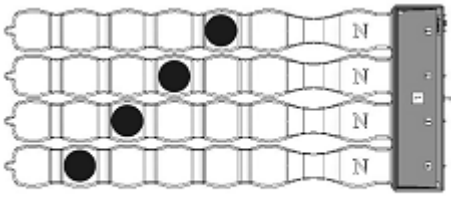


Fig. 5

- "Diagonal traveling" magnetic field creates simultaneous effect both of horizontal and vertical traveling magnetic field (right-hand screw rule) (fig 5). Simultaneously there is the activation of" the first inductor on the top strip-line, the second one on the underlying strip-line , the third inductor on the next underlying one and the fourth one on fourth bottom strip-line of the basic emitter. Traveling frequency is from 1 to 100 Hz, intensity - from 2 to 20 mTl. Then the second inductor activates on the first strip- line, the third one – on the second strip-line, the forth –on the third strip-line and the fifth –on the fourth strip-line and so on with the specified frequency.

The outward appearance of control board Fig.6.

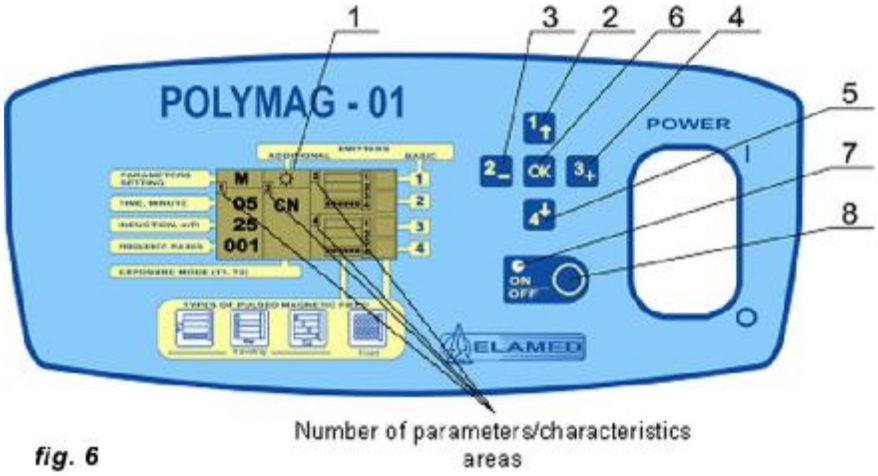


*fig. 6*

Intensity of magnetic field in the human organism tissues is defined by the magnetic induction.

Magnetic induction value in Measuring System is Tesla (Tl.) Polymag -01 device generates milliTesla - from 1 to 25 mTl.
Magnetic field easily passes (penetrates) through organism tissues, cloths, plaster, but rapidly damps depending on the distance. More favourable here is a solenoid. It surrounds the body around magnetic field practically completely penetrates it. Magnetic field does not make the heat effect therefore they are easily tolerated by the patients.
As there is the change of magnetic field according to amplitude and direction in time, so there are the action of electro-moving forces in the tissues and ring current are induced. In paramagnetic and diamagnetic molecules of bio-tissue induced currents render decisive effect. At a cellular level there is arise of rotatory moment under the action of which molecules are set (placed) along the basic axes of a rotational symmetry. As a result there is the change of cellular membrane and intracellular structures properties: membrane penetrability, diffusion and osmotic processes, colloidal state of tissue. Under the action of magnetic field there is the change of electronic potential of bio-tissue molecules, resulting in considerable increase of metabolic processes, oxidation-reduction reactions and free radical oxidation. The speed of enzymatic reaction, transfer properties of biological membranes is changed. This action is greatly expressed in blood capillary, where there is the change of penetrability, the state of endothelium, colloid osmotic pressure, improvement of microcirculation, stimulation of reparative processes, activization of immunoresponsiveness, increase of antibodies level, the change both of T and B lymphocyte, immunoglobulin in blood and kallikrein-kininov system. There is an expressed normalizing action on vegetative nervous system. Pulsed magnetic fields for their activity considerably exceed the action of constant and variable magnetic fields.

**1.4. Therapeutic action of low frequency, low intensity magnetic fields.**
In an area of emitter locating the magnetic field makes direct local effect, reflex effect on internal organs and organism systems, general action through central nervous system and mediate humoral and endocrine effect on all organism in a whole. Magnetic fields render normalizing action on an organism function: with the increased organism function it is reduced, and with the reduced one - it is increased. Under influence of magnetic fields many reactions of an organism are characterized by staging nature of course, and sometimes reaction changes right up to opposite. The action of magnetic has step character. One-time magnetic field exposure (action) is kept for 1-6 day, course - within 30-45 day. The constant magnetic field intensifies inhibitory, the sedative effect, and pulsed and pulsating magnetic field makes stimulating action on the central nervous system, improves metabolic processes in tissues, stimulates regeneration processes in injured tissues.

<u>Action on the central nervous system.</u>
The central nervous system is the most sensitive to action of magnetic fields, first of all, cerebral brain cortex, hypothalamus, thalamus and hippocampus.
Magnetic field has a number of beneficial effects on central nervous system:
- there is the change of conditioned-reflex activity with primary development of inhibitory processes;
- sedative action;
- normalisation of sleep;
- decrease of emotional stress
- intensification of hypothalamus secretory cells functional activity (there is increase of neurohormones products) and hypoxia;
- activation of nitrogen and carbohydrate - phosphoric metabolism in brain, that substantially increases its stability to a hypoxia;
- decrease of tone of cerebral vessels;
- improvement of blood circulation in a brain;
- elevation of mood, rising of physical and mental activity.

The action on vegetative nervous system reveals itself in:
- improvement of its trophic and stimulating function;
- decrease of peripheral receptors sensitivity resulting in analgetic action .
- decrease of perineural oedma
- improvement of functional conductivity in peripheral nerves.

Neuromuscular system.
Magnetic fields increase contractive force of skeletal muscles thus increasing muscular function. There is also the increase of tone of internal organs smooth muscular vessels.
Cardiovascular system is rather sensitive to the action of magnetic fields.
Here is also marked the best therapeutic effect: pulse becomes slower; heartbeat becomes more effective;
there is improvement of intra-vascular hemodynamics;
increased arterial pressure has the tendency to reduction; there is normalization of vessels walls tone and improvement of their elastic properties.
Extremities blood circulation is improved due to extension of capillary system.
There are also marked the favorable changes in micro-circulation and trans-capillary metabolism. In 30 minutes after the application of magnetic field there is increase of blood-flow speed in all micro-circulation sections, liquefaction of blood resulting in improvement of its flow properties: the opening both of reserve capillaries, anastomoses and bypasses; simultaneously there is the change of micro-vessels permeability.
These changes are in the basic of anti-edematous and anti-inflammatory actions.

Blood changes. The general effect : the activation of anti-coagulative blood system; ability to intra-vascular pariental thrombus formation is reduced ; ESR (erythrocyte sedimentation rate) slows down; the number of red blood cells and the quantity of haemoglobin in them is increased. Besides there is increase of leucocytes phagocytic activity, stimulation of the function of lymphoid tissue, increase of non-specific resistance of organism, there is the positive effect on immunogenesis.
Endocrine system.
The stimulation of hypothalamo-hypopysial (neuro-endocrinal) system causes chain reaction - endocrine Ferri lactases (paranephroses, thyroid gland, sexual Ferri lactases) with intensifying of numerous protective adaptive, adaptable reactions of an organism are stimulated.
Thus, to the most expressed, recognized medical effects arising at patients at application of a magneto-therapy are : stimulating action of injured tissues regeneration processes; immunomodulatory, improved blood circulation, micro-circulation, trophicity, metabolism and a metabolism in various organs and systems of an organism action; anti- edematous , anti-inflammatory and analgetic action

**1.5. Indications for "Polymag -01" magnetotherapy device application.**

**Nervous system diseases:**
- encephalopathy of a various genesis (atherosclerotic, post-traumatic, toxic);
- vertebro-basilar insufficiency with transient abnormalities of cerebral circulation;
- neuropathies , compression ischemic plexopathies, posttraumatic, toxic, alcoholic, radial plexitis
- infectious-allergic;
- neuritises of an infectious, toxic etiology;
- consequences of the closed craniocerebral trauma;
- disseminated sclerosis;
- migraine; children's cerebral paralysis.

**Blood circulation system diseases:**

- neurocirculatory dystonia of hypertonic type, essential idiopathic hypertension of I-II A degree, ischemic illness of heart with a stable stenocardia of big force tension;
- obliterating atherosclerosis of extremities vessels;
- varicose illness of extremities with venous insufficiency, phlebitis, thrombophlebitis;
- postoperative and posttraumatic lymphostasis.

**Respiratory apparatus diseases:**

- chronic bronchitis, chronic obstructive bronchitis;
- acute pneumonia in a stage of resolution , chronic pneumonia in a stage of an exacerbation;
- bronchial asthma; broncho-ectatic disease;
- pulmonary tuberculosis on a background of application of antibacterial therapy.

**Diseases of digestive apparatus:**

- chronic gastrodoudenitis, stomach and duodenal intestine ulcer, chronic colitis, dyskinesia of digestion ograns;
- chronic hepatitis; chronic pancreatitis.

**Diseases of osteo-muscular system and connective tissue**:

- osteochondrosis of backbone with vertebrogenic radiculopathies;
- joints deforming osteoarthrosis , arthritises of a various etiology (rhematoid, infectious, gouty, psoriatпc);
- tuberculosis of bones and joints on a background of treatment by antibacterial medicamentation.

**Consequences of fire and traumatic injuries:**

- of loco-motor systems (fractures, joints dislocations , injuries damages of joint meniscuses);

**Inflammatory diseases and traumatic injuries:**

- of soft tissues, tendons, joints , articulate bursa (bursitis, ligamentit, tendovaginitis etc.) hematomas.

**Diseases of urogenital system:**

- chronic pyelonephritis, chronic cystitis, chronic inflammatory diseases of female genitals, chronic prostatitis

**Endocrinopathy:**

- diabetic macro and mickoangiopathy , diabetic polyneuropathy

**Skin and hypodermic (subcutaneous) cellular tissue infection:**

- in a stage of the resolution or postoperative surgical intervention: furuncle, carbuncle, abscess;
- purulent wounds (posttraumatic, trophic, after burns and chilblain);
- an erysipilatous inflammation; chronic osteomyelitis.

**Immunodeficiency state**

**1.6. Contra-indication**

- Susceptibility to bleeding;
- Systemic blood diseases;
- Malignant neoplasms*;
- High grade hypotonia;
- The diseases proceeding with a high fever;
- The acute period of a myocardial infarction;

- The acute period of brain cerebral infarction;
- Skin, hypodermic cellular tissue, cavities infection prior to operative period, cavity puncture;
- Evident thyrotoxicosis;
- Pregnancy;
- Availability of an implanted electro-cardiostimulator.

*** Radial therapy, application of "Polymag -01" magnetotherapy is <u>not</u> contra-indicated on a background of chemotherapy treatment course.**

## 2. DESCRIPTION OF POLYMAG-01 DEVICE APPLICATION PROCEDURES

### 2.1 Technique of inductors-emitters setting.

Depending on influence area : foot, shin, femur, forearm, shoulder, the whole extremity, body you can use one, two, three or four basic emitters coils-assembly exposure units (hereinafter basic emitters) or a combination of them including replaceable (additional) one. Emitter is set on the influenced area through underwear, a towel, cotton or fabric lining-napkin.

Flat setting of emitters is applied, for example, on body, belly or a ring wrapping (to make of effect of the solenoid) of extremities or body.

Two basic are enough for wrapping of two extremities: one basic emitter to wrap two shins, the second basic emitter - for two hips and etc.

Four emitters are required to make solenoid around the body: two emitters are set on the back, and the other two on the belly and the front surface of chest (thorax) so that to cover both axillary and inguinal lymph nodes.

For backbone influence you can use two replaceable (additional) emitters being set along a backbone.

Basic emitters centralized control block is to be set at extremity, body sideway so that the traveling magnetic field be matched in all emitter exposure units.

Emitters with "N" mark on inductors are mainly set on the skin. It is especially important at application of horizontal and diagonal clock wise rotation "traveling"magnetic field as such poles setting increases effect of clock wise rotation. In order to increase the inhibitory effect, the counterclockwise (left-handed) rotation is applied, the emitters marked with "S" pole are to be set on skin

.

### 2.2. Zones of influence (exposure zones).

a) The direct skin influence (ex. with erysipelatous inflammation, trophic ulcers, purulent wounds;

b) The direct organ projection influence where there is pathology process (liver, stomach, intestine, backbone, joints, genitourinary organs etc.);

c) Segmental (metameric) zones of influence: cervical, thoracal, lumbosacral, tailbone segments of a spinal cord, metamericaly connected to internal organs and tissues of an organism. Magnetic field can change their function essentially;

d) Direct magnetic field exposure on cervical, thoracal, lumbosacral vegetative ganglions can greatly change regulating role of vegetative nervous system of internal organs and organism as a whole.

e) Areas of the general regulatory exposure mainly of the hormonal nature (paranephroses, ovaries, testicles, liver, pancreas, intestine, biologically active points).

### 2.3. Frequency of magnetic field exposure - general principles.

Frequency 2-5-8-10 Hz. is often used for:
- internal organs (liver, pancreas), endocrine system medical treat;
- stimulation of a smooth muscles of internal organs, walls of blood vessels, genitourinary system, stimulation of skin and mucous membrane reparative processes.

Oscillation frequency of internal organs electric potentials is about recommended magnetic field frequencies generated by device.

Frequency nearly 50 Hz is used to influence biologically active points, intero-and- proprioceptors , skeletal nervous-muscular body system, excretory gland to make active effect on a functional state of an organism as a whole. The frequency equal to 100 Hz is applied to make anti-inflammatory, analgetic , trophic effect due to improvement of local micro-circulation.

**2.4. Intensity of magnetic field exposure – general principles.**

Magnetic induction (2-4 mTl) of small intensity is indicated for acute clinical course with evident pain symptoms. At course treatment as far as inflammatory reaction and pain syndrome is being subsided intensity of radiation is being increased up to maximal every other 1-2 procedures. With chronic inflammatory process, posttraumatic injuries and joints, hematomas resorption, for stimulation of skin regeneration processes the intensity of magnetic induction is 15-20 mTl .

For immunity stimulation, intensity of a magnetic induction does not exceed 2 mTl. Under "fixed" pulsating field the maximal magnetic induction is 6 mTl, but total power will be more than that of the "traveling" magnetic field as during procedure time all inductors of basic and replaceable (additional) emitters run simultaneously.

**2.5. Magnetic field exposure duration time – general principles.**

For acute inflammatory processes with the evident pain symptoms, magnetotherapy procedure duration is 10-15 minutes with both inflammatory process and a pain symptoms subside treatment procedure time is up to 20-30 minutes.

The medical dose is defined of intensity of magnetic induction, procedure time, magnetic field both frequency and type.

The minimal medical dose - procedure time (exposure time) is 10-15 minutes with 2-5 mTl magnetic field induction intensity. The minimal medical dose is prescribed (indicated) for patient during disease acute clinical course, the weakened patient, children and the persons having severe diseases of cardiovascular system. The optimal medical dose - procedure time (exposure time) is 20 -30 minutes with magnetic field induction intensity 10 - 20 mTl. The optimal medical dose is indicated for all patients in the disease sub-acute clinical course and elderly age persons having no disease serious concomitants. Intensive medical dose - magnetic induction 21-25 mTl, procedure time - 30 min. Magnetotherapy procedure can be taken twice a day, 20 minutes each procedure (for example with chronic osteomyelitis on the background of antibiotic therapy). Intensive medical dose is indicated for young persons with chronic clinical course of inflammatory or degenerate - dystrophic process. Procedures are taken daily. The course of treatment is 12-15 procedures.

## 3. PARTICULAR MAGNETOTHERAPY PROCEDURES with «POLYMAG -01» DEVICE.

### DISEASES OF NERVOUS SYSTEM

DISCIRCULATORY ENCEPHALOPATHY

Etiological factors can be: atherosclerotic affection of brain vessels, different intoxications (including alcoholic), infections, etc.

Atherosclerotic discirculatory encephalopathy is widely spread in medical practice. Disease represents itself the complex of neurological and mental abnormalities caused by degenerative, dystrophic, atrophic changes of a cerebral tissue.

*Disease clinical presentation:* evident vegetative angiopathies, hypertensive and asthenic symptoms, weakness, excessive increased emaciation, an emotional lability, instability of attention, weakening of memory, low working capacity.

*Medical treatment* - procedures improving blood circulation in vertebrobasilar system, normalizing processes of psychic excitement and inhibition in cerebral (brain) cortex, normalizing subcortical vegetative centers function.

Among the treatment methods, the main are those stimulating processes on improving blood circulation in vertebro basilar system and normalising both excitative and inhibitory process in cerebral brain cortex and function of subcortical vegetative centers. The most expedient method of treatment and prophylaxis of the given disease is application of pulsed magnetic therapy on a cervical - collar area. The applied pulsed magnetic therapy on a cervical - collar area restores local cerebral blood circulation in vertebro basilar blood circulation system, that cardinally influences diseases clinical course.

**Treatment procedure.**

The basic emitter is being set on cervical - collar area, position of the patient - laying on a procedural couch.

Magnetic inductors marked with "N" mark are set in the direction toward the patient body. Magnetic field – "traveling" vertical top down. (Fig. 7). Magnetic pulses frequency -10 Hz, magnetic induction intensity -10 mTl. , procedure time - 20 min. Treatment course - 10-12 procedures.

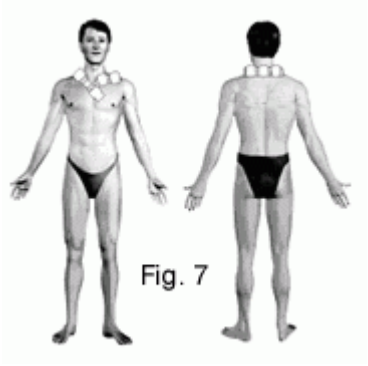
Fig. 7

TRANSIENT ABNORMALITY OF THE CEREBRAL BLOOD CIRCULATION

Disease arises on a background of hypertension, sometimes hypotension (lowered arterial pressure) at the patients, suffering cervical spine osteochondrosis with cerebral blood circulation insufficiency in vertebrobasilar system.

*Disease clinical presentation*: often and short-time giddinesses and transient paresis of extremities.

Physical methods of treatment are applied 2 weeks later from the beginning of disease, during the sub-acute disease clinical course. The most indicated physiotherapy method is magneto-therapy as it promotes: restoration of local blood- circulation in vertebro-basilar system, normalization of general blood circulation, reduction of blood coagulation, appearance of reserve capillaries both in brain blood circulation system and an organism as a whole.

**Treatment procedure.** The basic emitter is set across a couch or a bed. The patient lies back down on emitter so that the top strip-line covered cervical - collar zone with N polarity to patient body.

Magnetic field is to travel in the emitters top down towards the patient body (Fig. 8). Magnetic impulses frequency - 8-10 Hz, magnetic induction intensity - 5-10 mTl, procedure time - 15- 20 min., daily. Treatment course - 10 procedures.

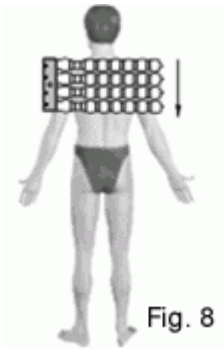
Fig. 8

NEUROPATHIES

Neuropathies - degenerative changes in peripheric nerves trunks.

Disease etiology: infectious, virus, compression-ischemic, vertebral (hernias of intervertebral disks), posttraumatic, toxic, endocrinopathic etc.

Degenerative changes in peripheral nerve leads to different moving disorders, sensitive and trophic disturbances in the innervation zone of injured nerve.

The use of magneto-therapy with the help of "POLYMAG -01" is mainly indicated for neuropathies as: neuropathy of radial nerve, neuropathy of ulnar nerve, neuropathy of median nerve, neuropathy of femoral nerve, neuropathy of sciatic nerve.

**Treatment curative effect**. Pulsed magnetic field makes sparing effect on affected nerve-muscular system improving microcirculation and blood circulation in the zone of influence resulting in anti-edematous, anti-inflammatory, analgetic action, increase of nerve-muscular excitability and conductivity, stimulation of metabolism and regeneration processes of injured nerve tissue.

**Treatment procedure.** While carrying magnetotherapy out with "Polymag-01" device during extremities acute clinical course of neuropathy and polineuropathy, the application of magnetic field in a "traveling" magnetic wave mode in a vertical plane towards an axis of a patient body is indicated. At that "traveling" magnetic field is directed from the center (both axillary, inguinal area) to periphery along the flow of arterial blood and flow of a spinal liquid trough peri-neural "fissure" of peripheral nerve promotes the better outflow.

Further on even if edema of extremity is not removed because of venous and lymphatic outflow abnormalities there may be applied "traveling" magnetic wave mode from periphery to center. With paresis of nerve-muscular system at the late disease clinical stage there may be applied pulsating magnetic field to stimulate regeneration of nerve fiber and nerve conductivity restoration.

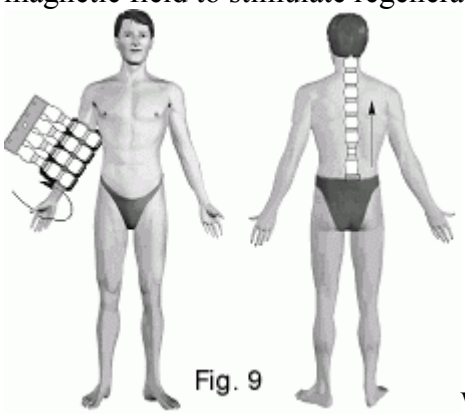
Fig. 9

With plexopathy of vertebral etiologies in addition to basic emitters being set on the extremity, the third basic emitter or replaceable (additional) one is set on the cervicothoracic part of spinal column.

Magnetic field mode is "travelling" bottom-up. See fig.9

In the case of lumbosacral plexopathy replaceable (additional) emitter is set on lumbosacral part of spinal column. This case magnetic field is "traveling" top down (fig. 10)

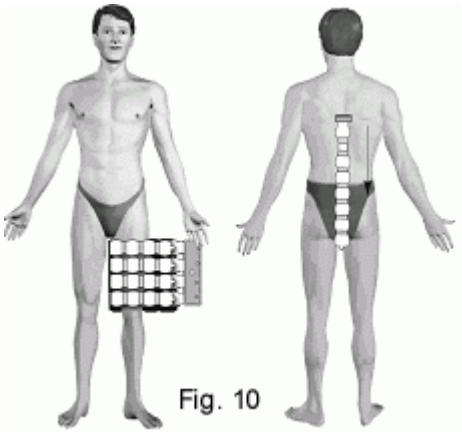
Fig. 10

The patient is in lying position on the couch, basic emitter is set on the affected extremity in the shape of solenoid covering (wrapping) shoulder and forearm (in the case of upper extremities affection) and covering (wrapping) lower leg (shin) and thigh bone in the case of lower extremities affection) With vertebral radiculopathies , besides basic emitters which are set on extremities and replaceable (additional) emitters are set under cervicothoracic and lumbosacral parts of spinal column with "N" polarity toward the patient body.

**Therapeutic dose.** For the disease acute clinical course magnetic induction intensity of « traveling» magnetic field is 2-10 mTl, frequency 100 Hz. , procedure exposure time - 10-15 min, daily. The course of treatment - 8-10 procedures.

At sub-acute disease period magnetic induction intensity of "traveling" magnetic field of 100 -50 Hz frequency is 10-15 mTl, procedure exposure time - 20 min, daily. The course of treatment - 8 procedures.

With peripheral nerve paresis by 10-15 days from the disease beginning stimulating magnetotherapy with "continuous" pulsating magnetic field, frequency 10 Hz and magnetic induction intensity 6 mTl is indicated. Procedure time is 30 min. Course of treatment includes 10 procedures.

## RESPIRATORY APPARATUS DISEASES

### BRONCHOPULMONARY SYSTEM NONSPECIFIC DISEASES

The middle and old age persons mainly with cardiovascular system diseases suffer from nonspecific diseases of bronchopulmonary system. Treatment of these patients is an actual problem of clinical pulmonology. Alongside with medicamental therapy halotherapy and magnetotherapy are mostly applied, as the methods having no side effect and tolerable ones.

The application of magneto- therapy gives positive effect:

- there is improvement both external respiration function and blood circulation in bronchopulmonary system;
- edema resorption;
- stimulation of adrenal cortex disturbed function.

Therapy with the help of magneto-therapy apparatuses generating pulses magnetic field makes sparing but more evident stimulating action on body organs systems and is found the wide application to treat diseases of bronchopulmonary system.

According to our data 76,3 % of patients taking magneto-therapy in complex treatment have got positive effect resulting in improvement of patency of broncho airways, liquefaction of phlegm and its easy discharge (outgoing) , regressing of bronchial asthma attack . And only 23.7% of patients have not got good improvements.

**Therapy procedure** with the help of POLYMAG-01.

Middle age patients with disease severe clinical course are in position lying in the back, two basic emitters of exposure assembly units are set on the thorax from the front and behind covering the

area of adrenal as that the ends of the emitters should touch each other, forming the shape of round solenoid. Emitters inductors marked with « N» polarity are directed to the patient body.

Magnetic field is in horizontal clockwise rotary mode. Magnetic impulse frequency – 100 Hz. For young patients with chronic obstructive bronchitis and bronchial asthma "fixed" pulsating magnetic field, frequency 6 Hz, magnetic induction intensity 6 mTl is indicated. Procedure exposure time - 20 min, daily. The course of treatment – 10-12 procedures.

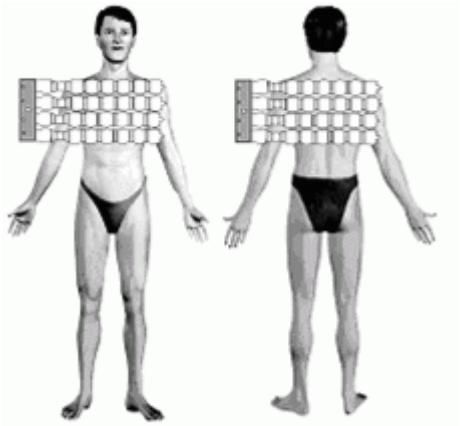

Fig. 11

PULMONARY TUBERCULOSIS

Magneto-therapy for pulmonary tuberculosis in complex treatment is applied only in the specialized stationary and treatment-and-prophylactic establishments (hospitals, clinics, tubercular sanatoria) on a background of an intensive antibiotic therapy.

With infiltrative tuberculosis magneto-therapy makes anti-edematous, anti-inflammatory, analgetic, resorptional effect and if it is cavernous pulmonary tuberculosis - promotes the healing of caverns stimulating regeneration processes.

**Therapy procedure.** Technique of emitters setting is the same as for treatment of nonspecific lungs diseases (fig. 11). "Fixed" pulsating magnetic field with pulse - repetition rate - 6Hz, magnetic induction intensity - 6mTl, exposure duration - 20-30 min., daily is applied. The course of treatment – 20 procedures.

## CARDIOVASCULAR SYSTEM DISEASES

IDIOPATHIC HYPERTENSIA

Idiopathic hypertension is repeatedly fixed rising of arterial pressure.

Now there is following classification of an idiopathic hypertension according to the level of arterial pressure:

I stage. Arterial pressure: systolic 160-180 mm. Hg; diastolic - 95-105 mm. Hg.

Symptoms. Periodically causeless headache, noise in the ears, giddiness, dream disturbance. High arterial pressure is normalized periodically without any treatment.

II A and B stages (average). Arterial pressure: systolic 180-200 mm. Hg, diastolic - 105-114 mm. Hg.

Symptoms. High pressure has steady nature and does not reduce to the normal state without taking medicaments. Often headaches, giddinesses, pain in the field of heart, hypertensic crisis.

III stage (grave). Arterial pressure: systolic 200-230 mm. Hg., diastolic arterial pressure 115-129 mm. Hg. Spontaneously, without medicamental treatment arterial pressure is not normalized. The clinical picture is characterized with various symptoms depending on from of internal body affection (vessels of a brain, heart, kidneys, etc.).

The exposure of the pulsed magnetic field on a collar zone results in vasodilatation in the influenced area, as a reflex in internal bodies of a thorax and brain, decrease of peripheric resistance leads to the reduction of arterial pressure and frequency of cardiac beat (heartbeat)

The exposure of the pulsed magnetic field on a collar zone and adrenal gland projection stimulates activity of endocrine system that find its positively reflect in generation of hormonums and enzymes.

With the exposure of traveling pulsed magnetic field there is improvement both of cerebral blood circulation and brain metabolism, resulting in its stability to the low oxygen content

Magnetic field stimulates inhibitory process of nerve system, makes positive action on dream, relieves emotional stress.

Magneto-therapy is indicated for I and II A stage essential hypertension. Magneto-therapy for patients with II B stage and III stage hypertension is applied individually under the doctors and physiotherapist control. Course treatment with Polymag-01 device efficiently decreases arterial pressure and gives possibility to reduce the dose of antihypertensive medicaments (only under the doctor's control!).

**Treatment procedure.** For treatment patients with idiopathic hypertensia the basic emitter with inductors "N" polarity mark "N" toward the body is set on neck posterior surface, cervicothoracic part of spinal column and collar area (fig. 12).

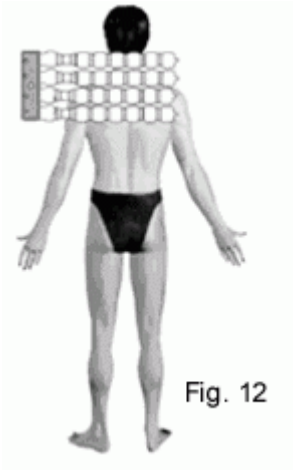

Fig. 12

For first 5-6 procedures "traveling" top down magnetic field is applied, magnetic field frequency - 90 -100 Hz., intensity of magnetic induction - 10-20 mTl., exposure procedure time - 15-20 min. This curative dose is the same for the next 5-6 procedures for the elderly age patients with essential hypertension above II A degree. For young patients and with I degree hypertension the further procedures are carried out with "fixed" pulsating magnetic field, magnetic field frequency - 6 Hz. , magnetic induction intensity - 20-25 mTl. Procedure time - 20-25 min..

Doctor's control of magneto-therapy tolerance is made by the method of pulse calculation and measurement of arterial pressure before and after taken procedure and at the end of course treatment as well. With renal hypertension the action (exposure) is carried out with two emitters. See fig 13.

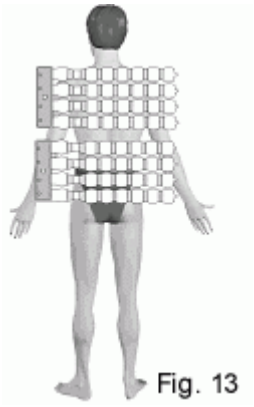

Fig. 13

## VEGETO-VASCULAR DYSTONIA OF HYPERTONIC TYPE (THE NEUROCIRCULATORY DYSTONIA)

Vegeto-vaslular dystonia - the disease with many symptoms and definitions.
At the heart of the disease is abnormalities of the vegetative regulation of internal organs functional activity. This disturbance is rear limited with only one organ but involves almost the whale organism that mean that to a certain extent the whole organism suffers of this or that neurologic disorders: weakness, easy fatiguability, irritability, headaches. Besides there may be vegetative crisis. Among patient complains the more often are heartbeat, chill, the sense of discomfort in breast, giddiness, sickness, bad eyes and diminished hearing.

As the disease has various manifestation only doctor can make diagnosis and prescribe treatment. There are mainly three types of vegeto-vaslular dystonia cardiovascular syndromes: hypertensive, hypotonic and cardial.

Application of pulsed magnetic therapy with the help of Ploymag -01 results in: normalization of high arterial pressure, stimulation of adrenal gland function, acceleration of nerve pulses conductivity from backbone to internal organs, subsiding of many disease symptoms.

**Treatment procedure.**

The patient is in lying position on couch. The basic emitter with "N" polarity toward the patient body is set on area of posterior surface of chest (neck, chest part of spinal column, adrenal gland area). Magnetic field type-traveling horizontal in the direction from left to right. See fig. 14. Magnetic field frequency - 10 Hz. Magnetic induction intensity - 2-5 mTl. Procedure time - 15-20min, daily. Treatment course includes 12-15 procedures.

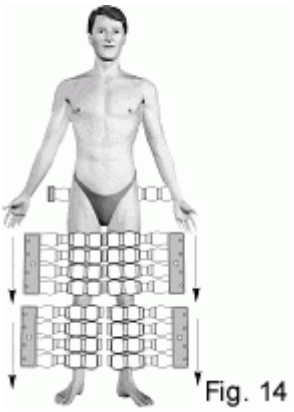

Fig. 14

ISCHEMIC DISEASE OF HEART (WITH STABLE EXERTIONAL ANGINA)

Ischemic disease includes the group of illnesses, stipulated by inconsistency between the need of myocardium in oxygen and its delivery. Heart vessels atherosclerosis - coronary arteries is the main reason of the disease.

Stenocardia is the short- time sensation of squeezing, pressing and burning behind the breast bone. The pain can be felt in the left hand, neck and shoulder.

There are several form of this illness, one of them is stable exertion stenocardia:

I functional class - there is heart attack at excessive physical activity;

II functional class - heart attacks arise at more than 500 m walk, or more then of one floor upstairs;

III functional class - heart attacks arise at more than 100-500 m walk, or one floor upstairs;

IV functional class – there is the appearance of heart attack in the state of rest.

Pulsed magneto-therapy is indicated for I-II functional stable stenocardia.

The purpose of Polymag-01 device action (exposure) on collar zone is reduction of pressure in the system of deep and subcutaneous veins, arteries, and at the same time reduction of heartbeat , improvement of microcirculation in myocardium, analgetic action, activation of carbohydrate and lipids metabolic action resulting in reduction of the contents of cholesterol in blood.

**Treatment procedure.**

Two basic emitters are set on the chest with "N" polarity toward the patient body so that to form ring solenoid. Magnetic field parameters: "traveling" horizontal magnetic field in the direction from left to right (rotating) , frequency - 5-10 Hz., magnetic induction intensity - 2 mTl., procedure time - 15-20 min., daily. Treatment course - 10 procedures.

Contraindications: abnormalities of cordial rhythm, implanted electro-cardio-stimulator

OBLITERANS ATHEROSCLEROSIS OF LOWER EXTREMITIES VESSELS

Atherosclerosis – it is wide spread chronic illness, characterized by arteries walls hardening with far cells and growing of conjunctive tissue with the formation of fibroid plaques narrowing lumen and disturbing physiologic function of affected arteries resulting in organic and general disorders of blood circulation. There may be no subjective symptoms for a long time. Arteries of lower extremities, which are subjected to often overloading or even general physical loading have such symptoms more often and early.

Men of 40 years old having excess weight, people with sedentary way of life suffer more often from obliterans atherosclerosis of lower extremities, presuppositions for it are smoke, alcohol, fat, rich with cholesterol food.

Main disease symptoms: the appearance of ischemic symptoms (inadequate blood supply of extremities). First the disease reveals itself only with physical loading: there is arise of weakness, undue muscles fatiguability, the sense of cold in the extremities, later unpleasant sensation – numbness, cold, pale skin, pains in sural muscles during the walk. The pain is of different intensity may be even in the sate of rest, sometime it is very severe. The pain is gone away in the sate of immobility due to the blood restoration, but it arise again with walking. This clinic symptom is called as intermittent claudication (Dejerine`s syndrome).

**Curative effect.** Pulsed magnetic fields from Plymag-01 device are indicated to treat lower extremities vessels obliterans arteriosclerosis at any its stage and the degree of pathology processes intensity as they make an effect on anticoagulative blood system , improve blood flowing, reduce the possibility of mural thrombosis, dilate vessels lumen, improve micro-circulation in capillaries and in vessels walls as well, stimulates the formation of new capillaries, makes anti edematous, obliterating, anti-inflammatory, analgetic action. With trophic ulcer it stimulates regeneration of injured tissues.

**Treatment procedure.**

Four basic emitters are set on the couch with "N" field polarity top to the surface of patient body. The patient lies on emitters so that it was possible to wrap up on shin or hip with one emitter and replaceable (additional) one is set on lumbar area (lumbar sympathetic ganglions).With two sided affection, these emitters are set simultaneously on both ships and both hips. See fig.15.

Magnetic field parameters: "traveling" magnetic field top down, frequency 10 Hz, intensity 20 mTl., procedure time - 20-30 minutes, daily. The course of treatment - 15 procedures. Magneto-therapy courses are being repeated 1-2 time a year.

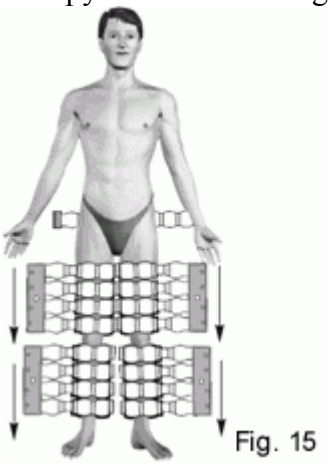

Fig. 15

## VENOUS SYSTEM DISEASES

VARICOSE DISEASE

Varicose disease – either weakness or malfunctions of valve system and vascular tissue relating veins dilation.

Predisposing factors to the development of the disease are congenital weakness of vessel wall, pregnancy, excess weight, long stay in the standing position, hard physical labour. The arising of varicouse disease is related to vessels injuries, trombophlebitis.

There are several stages of varicose disease. In the compensation stage the patients complain on cosmetic defect in the form of coiled varicose veins on the lower extremities. At disease grows progressively worse there is sub-compensation. At this stage there are complains on edema in the area of foots and ankle-bones, shin muscles fatigability, spasms in the night time. With the disease At the stage of de-compensation there is veins insufficiency of lower extremities, edema has stable nature, veins are greatly dilated, severe pains and spasms in gastrocnemius muscles. The disease after effects of both stages are trombophlebitis, trophic ulcer, infectious skin affection.

Magneto-therapy with the help of Polymag-01 device is carried out at all three stages of varicose disease clinical course.

**Curative effect.** The purpose of treatment at the first and second stages are: increase capillary blood flow, improvement of contractile function of vein vascular wall and reduction of varicose dilated veins size, prevention both of valve insufficiency of veins and de-compensation – after effects of chronic vein insufficiency with the development of trombophlebits, trophic ulcer.

**Treatment procedure.**

Four basic emitters are set on the couch with “N” polarity to the patient body. The patient lies on the emitters so that it was possible to wrap up one shin or hip with one emitter and replaceable (additional) one is set on lumbar area (lumbar sympathetic ganglions) Direction - “ traveling” magnetic wave down up (from foot to groin) - see fig.16. Frequency - 5-10 Hz, intensity of magnetic induction - 20 mTl. Procedure time - 20-30 min., daily. The course of treatment - 15 procedures. Magneto-therapy courses are repeated 1-2 time a year.

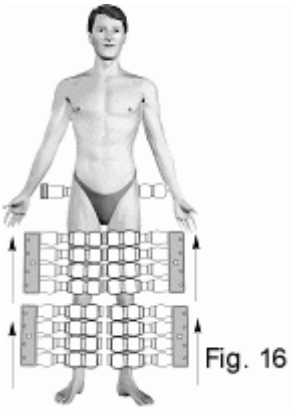

Fig. 16

THROMBOPHLEBITIS OF LOWER LEGS (SHIN) DEEP VEINS

Deep venous thrombosis reveals itself with the feeling of hardness in legs, arching pains, shin edema.

Predisposing factors leading to the development of this disease are traumas, the change of blood coagulability, venous haemostasia stipulated by the varicose disease, body excess weight .

Besides pains, the feeling of hardness and edema there are concomitants disease complications (aftereffects). The most particular shin (lower leg) veins thrombosis illness aftereffects is veins inflammation.

**Curative effect.** The action of pulsed magnetic field on shin tissue promotes reduction of circulated in them blood coagulability. Besides there is improvement of micro-circulation and

increase of vascular walls permeability resulting in partial thrombus dissolution, both edema and pain sensations decrease and assistance of thrombophlebitis prophylaxis.

**Treatment procedure.**

"N" polarity basic emitter is set on the affected zone. Magnetic field parameters: "fixed" pulsating magnetic field, frequency - 16 Hz, intensity -5-10 mTl, procedure time - 20 minutes, daily. The course of treatment – 10 procedures. Magneto-therapy procedures are combined with the application of heparin ointment on the vein affected area - magnetophoresis of heparin ointment.

CHRONIC THROMBOPHLEBITIS IN THE STAGE OF TROPHIC DISORDERS

Chronic thrombophlebitis at the stage of trophic disorders - inflammatory disease of veins more often arising on a background of shin veins varicose illness.

This disease reveals itself in pain and hardening along affected vein and redness over it. Disease long current process can result in occurrence of a trophic ulcer in the lower third of shin in area of ankle-joint. It arises as a result of venous blood stagnation when there is disorder of tissues feeding, and also under the influence of the traumatizing factor.

**Curative effect.** Treatment of chronic thrombophlebitis in a stage of an exacerbation by pulsed magnetic fields is proved by fact that the magnetic field promotes reduction of blood coagulability, dissolution of a thrombus and restoration of a blood-flow through a vessel. Anti-inflammatory action reduces inflammatory process in the affected vessels.

Improvement of microcirculation around of the affected vein results in increase of blood inflow rich with building elements, oxygen, and therefrom, on the contrary, outflow of accumulated inflammation products, Carbon dioxyde.

All together these result in liquidation of the inflammatory processes and stimulates a trophic ulcer healing.

**Treatment procedure.**

Basic emitters are set the say way as it shown in the fig. 16. Emitting surface with "N" polarity is directed to patient body. Type of magnetic field with thrombophledities - "continuous" pulsating, frequency -16 Hz, magnetic induction intensity -20-25 mTl., magneto-therapy procedure time - 20-30 min., the course of treatment - 10 procedures. Discontinuous pulsating magnetic field in the number of 10-15 procedures is indicated if there is inflammation regression in the disease clinical course with the presence of foot and lower leg trophic ulcer.

Disease has chronic character and takes long time supportive treatment allowing to avoid relapses. 40 days break follows the first treatment course and the repeated course should be done. Further on with the purpose to support disease remission you can take one more course of treatment, but this case the break between courses of treatment is to be 2-3 months.

## DISEASES OF LYMPHATIC SYSTEM

LYMPHOSTASIS

Regional disorder of lymph flow in the upper or lower extremities, buttocks after both tumor and regional lymph nodes ablation. There may be lymphostasis as well caused by traumatic or postoperative injuries of large lymphatic vessels.

Symptoms of disease: an edema and tissues cyanosis, drop of skin temperature, painless edema, loss of skin elasticity. Application of a magnetotherapy is indicated during any period of disease.

CHRONIC RECURRENT LYMPHANGITIS

Regional disorder of lymph flow arising at the presence of chronic, relapsing erysipilatous inflammation, a trophic ulcer, an eczema, epidermophytia on an extremity. Magneto-therapy is applied in the period of the core (main) disease subside.

**Curative effect.** The purpose of a magnetotherapy for regional lymphostasis: to expand skin vessels and to release (unload) deep tissues from lymph congestion, to activate lymph flow, to improve drainage function of deep vessels, to produce resorption, anti-inflammatory, analgetic action.

**Treatment procedure.**
The basic emitter is set on affected extremity where there is regional lymphostasis in the form of solenoid in the direction of magnetic field "N" polarity to the patient body. Magnetic field parameters: vertical "traveling" from the periphery to the centre, frequency - 50 Hz., intensity of magnetic field - 15-20 mTl. Procedures are carried out daily. The course of treatment includes 15 procedures. Magneto-therapy is recommended to be repeated in a month.

## ENDOECOLOGICAL AFTERTREATMENT

Pollution of an environment in modern conditions breaks endo-ecological balance in an organism that provokes the arising of new diseases and worsen the clinical course of the available ones, disturbs immunity, in this situation children suffer more often.

Endoecological aftertreatment represents itself multicomponent system of de-toxication including stimulation of lymph flow that greatly increases the taken therapy efficiency. At endoecologic aftertreatments the organism is cleared of slags and toxins on the cellular level. Lymphatic stimulation with pulsed magnetic fields is one of the important procedures of endoecologic aftertreatments.

**Curative effect.** Under influence of pulsed magnetic field there is a number of beneficial effects in ogranism:
- improvement of both permeability of cellular membranes, metabolic activity and blood flow;
- dilation both of arteriols of muscular type, pre-capillary sphincters and venules and veins;
- nonfunctioning capillaries become open as a result of direct myotropic action of a magnetic field on smoothly myocyte cells of a vascular wall.

Besides inside the vassals due to electromotive force there is regulation of laminar blood and lymph flow, improvement of blood rheological properties, reduction of thrombocytes aggregative ability. All these changes promote improvement of local blood circulation, both tissues feeding and oxygenation. General magnetotherapy makes immunomodulatory action.

**Treatment procedure.**
Four basic emitters are applied to wrap extremities in the form of solenoid. Magnetic field parameters: "N" polarity toward patient body, traveling vertical, magnetic pulse frequency – 5 Hz, magnetic induction intensity – 5-6 mTl, procedure time – 20-30 min., daily. Treatment course – 10-12 procedures. Exposure on the body is also possible, this case in upper body part the traveling magnetic field is going from the waist to the neck, and in the lower part – from the chest to the tailbone.

## LOCOMOTOR SYSTEM DISEASES

### OSTEOCHONDROSIS

Osteochondrosis - degenerate - dystrophic disease of a backbone when two near dorsals, fibrous ring between them, joints between dorsals` arches, muscles attached to them with tendons and apertures through which vessels and nerves are going through are involved in process. At the beginning of disease stage there is pain syndrome, and further on statics disorders and spinal root injury are being added.

The symptomatology of disease is connected to spinal roots squeezing in intervertebral apertures and development of an aseptic inflammation in them. As a result, fibrous ring between two dorsals loses its elasticity and resilience. With the physical activity , traumas of a backbone the intervertebral disk breaks and drops out into the intervertebral canal and squeezes spinal cord, spinal roots and vessels as a result of physical activity and backbone traumas. These lead to origination of vertebral radiculitis: cervical, thoracal, lumbosacral radiculitis (depending on injury localization) characterized with keen pain syndrome, musculo- tonic syndrome, sensitive and impellent disorders - paresis, paralyses of innervated muscles.

Very often backbone osteochondrosis is complicated with other degenerative dystrophic backbone diseases. Clinical presentation is aggravated.

**Curative effect.** POLIMAG-01 device pulse magnetotherapy is indicated at the disease early stages when there is only one symptom: feeling of discomfort in lumbar area with active both movements and, physical activity Application of a magnetotherapy quickly relieves pain symptoms and serves preventing the disease grows progressively worse as it improves the microcirculation abnormalities in the backbone area.

Magneto-therapy is indicated for diskogenic radiculites acute conditions begging with the first days of the disease exacerbation as pathologically proved method of physio-therapy with anti - edematous, anti -inflammatory, desensitizing, anesthetizing, trophic effect , promotes faster restoration the affected nerve function.

**Treatment procedure.**

There is affection of nerves of upper extremities, occipital region of head, intercostals nerves with thoracocervical osteochondrosis so the basic emitters are set on cervicothoracic part of spinal column and collar area. See fig. 17.

Fig. 17

When peripheric nerves of the top extremity are affected the second basic emitter is set on cervicothoracic part of spinal column, and replaceable (additional) emitter is set along the back-internal surface of affected upper extremities. See fig. 18

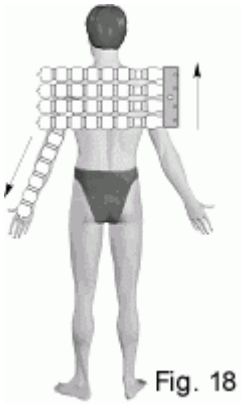

Fig. 18

With oteochondrosis of backbone lumbosacral part the basic emitter is set on lumbosacral part. See fig. 19.

Fig. 19

When scatic or femoral nerve is affected the patient lies down with lumbosacral part on basic emitter and two basic emitters are set around thigh and lower leg of affected extremity in the form of solenoid. In both cases “N” polarity emitting surface toward the patient body is applied. See fig. 20.

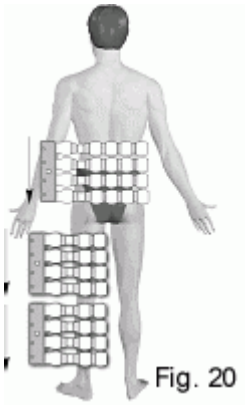

Fig. 20

Magnetic field parameters: “traveling vertical top down on extremities (along the flow of arterial blood and spinal liquid in perineural groove); on the thorax part – from the waist to upper part; on the waist part – from first lumbar vertebra to coccyx.

Magnetic pulses frequency is 100 Hz at the beginning of the course is gradually cut down to 10 Hz by the end of the course. Magnetic induction at the beginning of the course is 5-10 mTl, by the end – 15-20 mTl. Procedure time - 20-30 min., daily. Treatment course includes 12-15 procedures.

## DEFORMING OSTEOARTHROSIS

Disease of dystrophic nature joints characterized by the affection of articulate cartilages and also paraarticular tissues. In the disease ground there is the abnormalities of metabolic processes in organism that finds its reflection on joints state. Articulate cartilages in that case receive less necessary nutrients and gradually wear out.

Similar changes take place in a joint at ageing, but of more slow character and smaller expressiveness. Therefore a deforming osteoarthrosis is characterized as premature aging of articulate cartilage.

The disease symptoms: joint pains, fractures, curvature of extremities and more often of thigh-bone, joints inflammation. Hip and knee large joints and also fine joints of hand and foots are affected with an osteoarthrosis more often.

Patients suffering from deforming osteoarthrosis feel a short morning stiffness.

The pain increases mainly at a load on a sick joint, within day it usually decreases or disappears at the state of a rest. There is edema with joint immobilization.
Intensity of a pain is increased by the evening. There may be also crunch in the affected joint.

**Curative effect.** Magnetotherapy with POLYMAG-01 device plays one of the leading parts in complex treatment and prophylaxis of the disease. Pulsed magnetic field has analgetic action, edema relief, improvement of metabolism in para - articular tissues, regenerative action resulting in positive effect on joint function and finally enables to prevent disease growing progressively worse.

**Treatment procedures.**

With mono-affection the basic emitter is wrapped round a large joint (ankle-joint, knee, hip, shoulder, radiocarpal) or hand, foot joints, covering nearby tissue close to affected joint. With poly-arthrosis all 4 basic emitters are applied at the same time. Emitter with "N" mark polarity is set in the direction of cutaneous covering.

With hip joint affection the patient lies gown on the replaceable (additional) emitter so that the last emitter inductor is to be set on lumbosacral part of spinal column, then the emitter is to cover (enfold) the joint in the area of greater trochanter close to front hip joint. See fig. 21

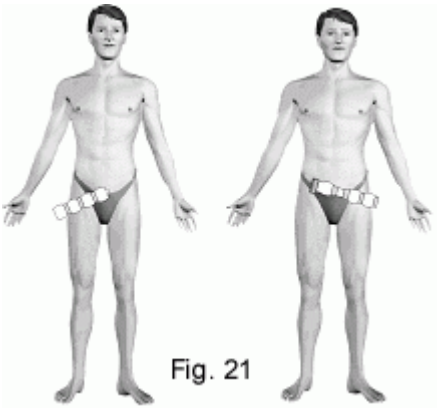

Fig. 21

When shoulder joint is affected the patient lies down on replaceable (additional) emitter so that the last emitter inductor is to be set on cervicothoracic part of spinal column covering (enfolding) the whale joint. See fig. 22.

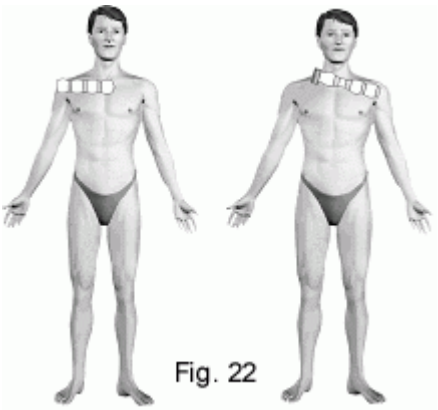

Fig. 22

Magnetic field parameters. For evident pain syndrome and synovitis "traveling" horizontal, rotating magnetic field in the direction from left into right is applied. Magnetic field frequency - 100 Hz, magnetic induction intensity – 10-15 mTl. When synovitis is not presented, fix pulsating magnetic field with frequency - 10 Hz, magnetic induction intensity - 6 mTl is indicated. Procedure time – 20-30 min., daily. Treatment course – 15-20 procedures.

ARTHRITIS OF DIFFERENT JOINTS

Arthritis - an inflammation of a joint which arises first of all in internal synovial membrane of joint. Inflammatory process can affect the other structures of a joint, - a cartilage, joint capsule, periarthric tissues - ligaments, sinews.

Arthritis may be infectious, bacterial, rheumatoid, gouty, psoriatic reactive etc.

Disease symptoms practically for all arthritis forms: the paint during active and passive motion locomotor activity. Symmetric or asymmetric affection of the big or little joints may take place depending on disease form. Movement restriction (stiffness), joint redness, swelling, local or general rise of the temperature may also take place. Disease clinical course has chronic character, calm (quit) periods are changed with acute condition so the patient should right estimate all unfavorable factors: increased physical activity, over- cold.

**Curative effect.** Application of pulsed magneto-therapy for scapulohumeral periarthritis, epicondylitis, bursitis, arthritis has positive curative effect: improvement both of blood circulation, microcirculation in paraarticular bursa and joint tissue, normalization of metabolic processes, acceleration of edema decomposition, inflammation processes are relieved, the pain is decreased, joint function is restored quickly.

The taken course of treatment is mainly leads to recovery or at least inhibits the chronic disease grows progressively worse extending remission period.

**Treatment procedure.**

With momo- arthritis only one emitter is applied, with poly- arthritis – 1-4 emitters. Affected joint/joints is/are wrapped with emitter in the form of solenoid, "N" polarity toward the joint surface. Magnetic field parameters – "traveling" horizontal from left into right (clock wise rotation). Magnetic field pulse repetition frequency - 100 Hz, magnetic induction intensity - 5-10 mTl, procedure time - 15-20 min. As far as the inflammation subside in affected joints frequency of magnetic field is to be reduced to 10 Hz, while intensity is to be increased up to 15-20 mTl, procedure time is being enlarged up to 25-30 minutes. Course of treatment includes 15 procedures. As the disease has chronic character it is necessary to carry out repeated courses of pulsed magnetic therapy 2-3 time a year with the purpose of metaphylaxis.

With rhematoid polyarthritis the patient lies down on the replaceable (additional) emitter with the adrenal area on it with the purpose to stimulate depressed glucocorticoid function of adrenal cortex, the basic emitters in the form of solenoid are set around the affected joins.

## TRAUMAS OF LOCOMOTOR SYSTEM

FRACTURE OF THE BONE

Fracture – damage bone tissue structure integrity.

Fractures can be closed, open, with displacement and without it.

Fracture is followed with intensive pain and fracture area deformation. There may be hemorrhage and tissue edema around the place of bone fracture.

**Curative effect.** Application of pulsed magnetic therapy for bone fracture promotes both hemorrhage resorption in the fracture surrounding tissue due to microcirculation improvement and formation of calls , removes edema, speeds up regeneration of bone tissue and increases its strength , reduces muscle spasm, prevents muscle atrophy.

**Treatment procedure.**

It is recommended to start magneto-therapy with the Polymag-01 device beginning with the 3-5 day from the moment of bone fracture. The basic inductor is set around an extremity in a place of fracture, on a thorax in a place of ribs fracture, on a backbone in a place of vertebra fracture. Emitting surface "N" polarity is directed to the patient body. Magnetic field parameters: "fixed" pulsating, frequency -16 Hz, magnetic induction intensity -6 mTl, procedure time - 20-30 min., the course of treatment includes 10 procedures. Further on in order to stimulate the callus creation discontinuous pulsating magnetic field of the same parameters with magnetic field pause frequency rate equals to 1-2 seconds is applied. Treatment course includes 8-10 procedures.

*Note: Presence of metal apparatuses to join bone fragments is not contraindication for magnetic therapy application.*

TRAUMAS OF JOINTS

Internal traumas of joints - traumatic injury of a joint without damages of periarthric capsules integrity. Traumatic injury of knee joint combined with the injury of joint meniscus is the mostly met in every day practice.

Disease is characterized by an acute pain while walking and joint flexion. In a joint there is accumulation of excess quantity of intraarticular liquid.

In case if an operative treatment is not indicated, pulsed magnetic field with the help of POLYMAG-01 device is assigned as anti-inflammatory, anti- edematous, resorption therapy. Treatment with POLYMAG device is to be start on the third day from the moment of trauma.

**Curative effect.** Traveling pulses magnetic field curative effect: reduce of tissue edema, resorption of accumulated liquid and blood from the articular joint cavity; due to the acceleration of blood circulation there is improvement of metabolic processes beneficially resulting in joint tissue regeneration. The treatment with POLYMAG-01 device reduces the probability of contraction formation (stable restriction of join mobility).

**Treatment procedure.**

The knee joint is wrapped with basic emitter forming the ring solenoid, "N" polarity is directed to cutaneous covering. Magnetic field parameters: "traveling" horizontal from left into right (rotating), frequency 100 Hz, intensity 15-20 mTl, procedure time -20-30 min, daily. The course of treatment includes 12-15 procedures.

BRUISE OF SOFT TISSUES, HEMATOMA, POSTTRAUMATIC EDEMA

With soft tissue (cutaneous covering, subcutaneous cellular tissue, muscles) bruises as a result of blood vessels injury there are hemorrhages in soft tissues, edema, a pain because of the receptors irritation and further on the appearance (arising) of reactive inflammation as a result of blood adsorption. Depending on quantity of bruise it can resolve completely or there can be arisen encapsulated cysts. Therefore, the earlier resorptional therapy is started, the probability of trauma complications arising will be less.

The second reason of edema formation in soft tissues is fractures of bones, intraarticulate injuries.

**Curative effect.** Application of a magnetotherapy promotes hematomas resorption in short period of time, tissues edema removal , creation of anelgetic and anti-inflammatory action due to improvement of both blood circulation and lymph flow and a blood outflow through venous vessels.

**Treatment procedure.**

The basic emitter with "N" polarity toward the patient body is set on the area of soft tissue trauma or the area of edema in postoperative period, bone fracture. On the extremities the emitter is wrapped around it. On the body it is set along the patient body.

Magnetic field parameters - "continuous", pulsating, frequency -16 Hz, intensity of magnetic induction - 6 mTl, procedure time -30 min., daily. The course of treatment includes 15 procedures.

CHRONIC OSTEOMYELITIS, PURULENT WOUNDS

Treatment both of soft tissues, bones, large joints open major injuries is one of the complicated problems of surgery and traumatology.

It is explained by the fact that such injuries are often combined with purulent complication and disturbance of local and general circulation in addition there is the presence of wound infection pathogenic organism high stability (a staphylococcus, blue pus bacillus ...) to antibiotics.

Therefore the problem of purulent wounds prevention and treatment stands actually now-days and there is continuous search of new methods of treatment.

**Curative effect.** The application of low-frequency magnetotherapy for infected open bones fractures treatment has positive effect. There was noted the increase of antibiotic therapy efficiency;

the purulent wound is 2-3 days early cleared off necrotic tissues, there was noted speeding-up of epithelization and early disappearance of perifocal inflammation. Magneto- therapy has allowed to carry out autoplasty for autotramsplantation in earlier period.

At patients with chronic fire, post-traumatic and hematogenous osteomyelites, as well, there was observed the evident positive effect: the inflammatory phenomena in the lesion focus of an osteal tissue subsides 3-5 days earlier, decrease of quantity of pus flow , both edema, skin hyperemia and infiltration of soft tissues around a fistula disappears . More evident therapeutic effect has been reached from application of pulsed magnetic therapy.

**Treatment procedure.**

The basic emitters are set atop of a wet or dry gauze bandage on a wound with "N" polarity emitting surface. At the beginning the course the treatment is carried out with "fixed", pulsating magnetic field, frequency - 16-10 Hz, intensity of magnetic induction - 4-6 mTl, procedure time includes 30 min. or twice a day for 20 min. per each procedure. Later, after 8-10 procedures, pulsating, discontinuous "fixed" magnetic field is indicated, with the same intensity and duration of magnetic field (magnetic field pause frequency rate - 1-2 seconds). The total number of procedures per treatment course from 15 to 30.

## ENDOCRINOPATHY

### DIABETIC MICRO-MACRO - ANGIOPATHY

Diabetic angiopathy is vascular complication of long-acting noncompensated diabetes and obnormalities of carbohydrate and lipidic matabolism accompanying it.

There is pathology development both with insulin dependent and insulin independent forms of pancreatic diabetes. Primary affection localization - the lower extremities. Forms of affection - from weak trophic impairments up to trophic ulcers and the diabetic gangrene of foot resulting in extremity amputation.

**Curative effect.** Magneto-therapy is applied as an obligatory element of angiopathy complex therapy at pre gangrenous period. Magnetic field of POLYMAG device makes analgetic, antispasmodic action, gives favorable influence on carbohydrate, lipide and albuminous metabolic exchange, improves collateral blood circulation, stimulates regeneration both of affected nervous tissues at trophic diabetic ulcers.

**Treatment procedure.**

Lower leg and foot of the affected extremity or both extremities with two-sided affection are wrapped with emitter "N" polarity emitting surface is directed to the patient body. See fig. 14. Magnetic field parameters: "traveling" top-down diagonal magnetic field. Frequency - 5-10 Hz, intensity of magnetic induction - 10-20 mTl. Procedure time- 20 min., daily. The course of treatment - 15-20 procedures. The courses of treatment are repeated 2-3 time a year.

### DIABETIC POLYNEUROPATHY

Diabetic polyneuropathy - complication of diabetes, with affection of peripheral nervous system. It is characterized with affection, mainly, sensitive and trophic nerves, but there may be affection of motor nerves as well.

Polyneuropathy main symptoms (they can reveal themselves separately or all together) are:

- intense pain in lower legs even in the state of rest , at night;
- the feeling of chill in legs;
- lost of sensitivity and foot numbness;
- burning sensation, the unpleasant sensations arising with a touch of clothes or bed-clothes to tissue (often at night);
- atrophy of muscles;
- bad healing of scratches and abrasions – one or two months instead of one-two weeks.

**Curative effect.** Under the action of pulsed magnetic field there is local improvement of micro-circulation leading to normalization of metabolic processes in the peripheral nerve endings,

improvement of nerve pulses conductivity through nerve fibers stimulating restorative function of affected peripheral nerve endings resulting in reduction of pain.

**Treatment procedure.**

Foot and lower leg (both foots and lower legs) are wrapped with basic emitter. "N" polarity emitting surface is directed to the patient body. Magnetic field parameters: "traveling" top down in the direction of arterial blood flow and flow of spinal liquid along the peripheral nerves. Frequency - 10 Hz. Magnetic induction intensity - 10-20 mTl. Procedure time - 20-30 min., daily. The course of treatment includes 15-20 procedures. The treatment courses are repeated 2-3 time a year.

## DISEASES OF GASTROINTESTINAL TRACT

PANCREATITIS IN THE SUBACUTE AND CHRONIC CLINICAL STAGE.

Chronic pancreatitis - the inflammatory disease of a pancreas leading to the progressing decrease both external and internal secretion function.

Risk factors leading to disease development are alcoholism, diseases of biliary tract, stomach and a duodenal intestine, toxic influences - chemical substances, including medicinal preparations, malnutrition.

The chronic pancreatitis is revealed itself with pain syndrome, accompanied with nausea, vomiting and "belting pains".

**Curative effect.** Pulsed magnetic therapy on the area of stomach (pancreas) is indicated in the period of disease mild clinical course.

The purpose of treatment with traveling pulsed magnetic field: increase micro-circulation in tissues of a pancreas, to make analgetic, anti-inflammatory, anti-edematous action, to stimulate pancreas external and internal secretion function.

**Treatment procedure.**

Treatment with POLYMAG device is recommended to start in subside period of disease clinical course. Patient lies on the basic emitter being set in thorax and lumbar parts, and the replaceable (additional) one is set on the stomach area over pancreas projection. Emitting surface is surface of "N" polarity. See fig 23. Magnetic field parameters: "traveling" horizontal in the direction from left into right. Frequency - 5 Hz, magnetic induction intensity - 2 mTl. Procedure time includes 10-15 min, daily. The course of treatment - 10 procedures.

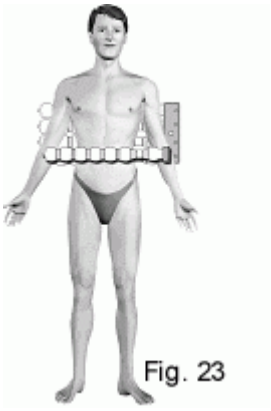

Fig. 23

CHRONIC HEPATITIS

The main part of liver chronic diseases (up to 90 %) is its virus affections.

Hepatitis disease (1/3 patients with acute hepatitis and 2/3 with chronic hepatitis) is caused by HCV (C virus hepatitis).

Long-term tests of a-2 interferon (ropheron, intron) anti-virous preparations have shown low efficiency of monotherapy for C virus hepatitis treatment.

Authors of these methodical recommendations carried out clinical tests of B and C virus hepatites treatment with Polymag-01 device and marked the positive effect.

Treatment procedure: the basic emitter (coil – inductors assembly exposure unit) with “N” polarity is set on the liver area. Parameters of magnetic field: “traveling” horizontal in the direction from right into lift (conuterclockwise), frequency- 8-10 Hz. Magnetic induction intensity- 20 mTl. Procedure time- 20-30 min., daily. The course of treatment includes 12-15 procedures. Magneto-therapy course is to be repeated in 3 months. See fig. 24.

Fig. 24

29 patients (18 men and 11 women) at the age of 19-55 years took part in medical examination. 15 patients were included in group where POLYMAG -01 was used for treatment, the rest 14 were included in the second group where treatment with POLIMAG-01 device has been carried out simultaneously with Amiksin medication.

**Approbation criteria were:**

1. patients age (from 18 to 55);
2. level of AST and ALT – from 2 to 5 N;
3. absence of mixed – hepatitis (HBV+HDV+HAV);
4. absence of severe accompanying somatic diseases (an alcoholic hepatitis, a cirrhosis of a liver, CHD ) narcological dependence;.
5. informed patient consent for medical examination;,
6. absence of anti-virus treatments in the anamnesis last 3 months before examination.

Exclusion criteria were :

1. patients age <18 and >55 years,
2. normal values of AST, ALT,
3. increased level of AST, ALT > 5 N,
4. mixed – hepatitis,
5. the presence of severe accompanying diseases,
6. drug addiction (narcotism)
7. anti-virus treatments for last 3 months before examination

TESTS PROCEDURE

Control group includes 14 persons, patients with C chronic hepatitis, who took treatment with Polymag -01 device together with inductor of endogenous interferon with Amiksin medication. Under the following medical regimen: the first medical dose - 0,250 mg., then within a month - 0,125 mg. every other day.

All patients have been examined on biochemical analysis of blood, test on anti-HCV, analysis of RNA HCV with qualitative and semi-qualitative viremia assessment

**Taken results:**

a) blood biochemical parameters

Treatment efficiency was estimated both by a level of transaminase activity which are associated with a degree of cytolytic syndrome and parameters of thymolveronal test defining intensity mesenchymal -inflammatory process in liver

The average level of AST and ALT activity prior to treatment exceeded norm by 3 and 4 times accordingly in both groups. Thymolveronal test was more than 5 units.

In the middle of treatment i.e. in 2 weeks in the first group there was marked decrease of average parameters of both transaminases, thus activity of ALT has been reduced almost 2 times at 5 patients.

After course of treatment there was a normalization of activity level at 4 patients, 11 patients had the normalization of thymolveronal test level

In the second group of patients after taken course treatment with device P0LYMAG-01 (on a background of Aminksin) there was marked both normalization of ALT and thymolveronal test value indexes at all patients.

b) Study of HCV RNA

Before treatment there was found out HCV RNA and anti-HCV at all patients. Assessment of HCV RNA testing results in the examined (tested) group had shown that there was not found HCV RNA in the blood of 4 patients from the 1st group and 8 from the second one after one month treatment. Besides at HCV RNA quantitative assessment there was marked 5 -10 time reduction of blood serum dilution (where RNA HCV had been tested) at 5 patients of the first group and at 3 ones from the second grope that was the evidence of HCV RNA and anti-HCV level quantitative reduction.

Thus 30 % of patients of the first group and more than 80 % of the second had positive virology results.

Anti-HCV on IgG have been kept at all 29 patients with C chronic viral hepatitis.

BILIARY DYSKINESIA

Biliary dyskinesia - functional abnormalities of gall-bladder and bile - duct motor activity owing to the uncoordinated, delayed, insufficient or excessive reduction of gall - bladder or sphincteric apparatus.

In the mechanism of these abnormalities the leading part belongs both to neuro- vegetative innervation and secretory function of a digestive tract changes.

Besides vegeto-vascular dystonia, abnormalities of the nutrition regime, diseases of other organs of a digestive tract play role in the development of biliary dyskinesia . Abnormalities of urinary bladder empting results in stagnation of bile, changing of its physio-che mical properties and development of cholelithiasis.

As a rule, patients complain on boring, dull ache in right hypochondriac region, the dyspeptic phenomena: drop of appetite, an eructation, a nausea, a bitter taste in a mouth, an abdominal distention.

The dietotherapy takes an important place for dyskinesia abnormalities treatment: exception of fat, fried, spicy dishes, meat and fish broths, smoked products, chocolate, ice-cream. Cholagogue preparations and mineral waters are applied together with a traveling pulsed magnetotherapy.

**Curative effect.** Traveling pulsed magnetic field treatment objective: to make analgetic, anti-inflammatory and spasmolytic action.

**Treatment procedure.**

Treatment with POLYMAG device starts in the period of disease exacerbation subside or non attack period with the purpose of prophylaxis. The basic emitters setting on the area of liver and gall -bladder is the same as for chronic hepatitis Frequency - 5-10 Hz, intensity of a magnetic induction - 10 mTl., procedure time - 20 minutes, daily. Course of treatment includes 10-12 procedures.

CHRONIC GASTRITIS, GASTRODUODENITIS

Chronic gastritis, gastroduodenitis is a disease of a stomach, duodenal intestine revealing itself with a long inflammation of its mucous. Disease clinical course - undulating in the form of disease exacerbation and long remission.

Disease symptoms: gastritis clinical course in its acute period depends on gastric juices acidity. With secretory deficiency the main abnormalities are: abdominal fullness, boring pain in the pit of the stomach, the filling of repletion after the meal, nausea, regurgitation, eructation more often with air. Because of gastric discomfort some people control themselves in meal that results to weight loss. At a palpation of a stomach there is moderate pain in epigastric fossa and pyloroduodenitis areas. The gastritis with normal and exceed acidity are frequently met at a young age. Besides pain symptoms there is the heartburn after meal, an eructation of acidic, predilection to constipations, tongue is covered with a plentiful white incrustation. Very often the gastritis is accompanied with duodenitis, an inflammation of duodenum mucous.

**Curative effect.** POLYMAG device treatment objective: to make analgetic, anti-inflammatory action, to increase microcirculation in stomach and duodenum wall, to make spasmolytic, analgetic, anti-inflammatory action, to normalize motor and secretory function.

**Treatment procedure.**

The basic emitter is set on the stomach: with magnetic field "N" polarity to the patient body at hypo-acidity, at hyper-acidity – "S" polarity magnetic field to the patient body. Magnetic field parameters: "traveling" horizontal in the direction from left to right with decreased gastric secretion and from right to left with increased gastric secretion. Frequency -5 Hz, intensity of magnetic induction - 5-10 mTl, procedure time - 20 min., daily. The course of treatment includes 10 procedures.

PEPTIC ULCER BOTH OF THE STOMACH AND DUODENUM

The peptic ulcer is one of the most wide-spread diseases of alimentary organs, 50% patients of hospital gastroenterology departments are patients with stomach or duodenum ulcer. Disease develops as a result of excitation and inhibitory processes abnormalities in CNS and, as a result, abnormalities of regulating influence for balance between gastric juice activity and protective abilities both of stomach mucous and a duodenum.

The clinical picture of disease is characterized by a pain in epigastric area immediately or a little later after meal depending on ulcer localization. Patients are suffered from dyspeptic symptoms: eructation air, nausea, heartburn, constipations.

Application of pulsed magnetic therapy is a component part of complex treatment and it is recommended at the disease subside period and remission phase.

**Curative effect.** The pulsed magnetic field blocks nervous impulses of pain center making analgetic effect, improves micro-circulation in stomach mucous, makes both spasmolytic trophic, anti- edematous and anti-inflammation action, stimulates metabolism and regeneration of mucous injury.

**Treatment procedure.**

The basic emitter is set on the stomach with "N" polarity to the patient body. Magnetic field parameters: "fixed", pulsating, frequency - 5 Hz, magnetic induction intensity- 4-6 mTl, procedure time - 20 min, daily. The course of treatment includes 8 procedures.

In order to stimulate the healing of ulcerative defect the second half of magnetotherapy course is to be carried out with an discontinuous operation mode of a pulsating magnetic field with the same frequency and intensity. The course of treatment includes 7-8 procedures.

**DISEASES OF FEMALE GENITALS**

Inflammatory diseases of female genitals take perhaps the first place among a gynecologic pathology on frequency and severity of caused abnormalities. Acute clinical stage of the diseases need hospitalization, as a rule, antibiotic therapy and other anti-inflammatory medicines are applied which are not always effective. Further on, inflammatory process can take a chronic clinical stage and results in various complications and sterility.

Group of inflammatory female genitals diseases includes: vulvitis, a vaginitis, endoetritis, salpingits, adnexitis and others.

Various microorganisms can be the causative agents of inflammatory gynecologic diseases but the further development of process depends on an organism reaction. The microorganism can serve as reinforcing stimulus for originally caused process, then there comes the moment, when microbe availability is not mandatory for disease inflammatory process. Woman sexual sphere chronic inflammatory diseases symptoms: decrease of organism general immunological reactivity, sometimes there are abnormalities of ovaries hormonal function, quite often there is found out both stability of a microflora to antibiotics and insufficient efficiency of antibacterial therapy.

**Curative effect.** Therefore, physiotherapy method takes special importance for female sexual sphere chronic inflammatory diseases treatment. In particular, magneto-therapy greatly influencing immunity increase arises microflora sensitivity to antibiotics, improves local blood circulation, causes anti-inflammatory effect, prevents development of adherent inflammatory process in uterus tubes resulting in, as a rule, to sterility.

**Treatment procedure.**

Treatment with a help of pulsed magnetic field starts in the period both of acute inflammatory process or chronic inflammatory exacerbation process subside.

One basic emitter is set on the stomach bottom and pelvis, and the second one - on the lumbosacral part of spinal column and pelvis. Emitter's polarity – "N", magnetic field type – "continuous", pulsating, frequency – 10-16 Hz., magnetic induction intensity – 4-6 mTl, procedure time – 20 min. After 6-8 procedures there is the change of procedure technique, this time magnetic field parameters: "traveling" horizontal in the direction from left to the right (rotating). See fig. 25. Frequency - 100 Hz., magnetic induction intensity - 2-4 mTl, procedure time – 30 min., daily. The course of treatment includes 8-10 procedures. The course of treatment is to be repeated within a year.

**Note! Treatment of gynaecological (female) disorders with the help of POLYMAG-01 device is not indicated during the menses period.**

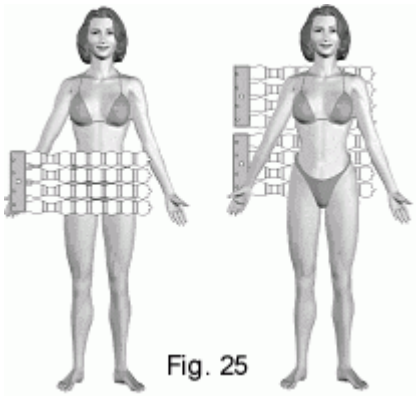

Fig. 25

THE DISEASES CAUSED BY THE OVARIA HYPOFUNCTION

Hypo-menstrual syndrome is a disease caused by ovaria hypofunction, infantilism, acute and chronic infections, abnormalities both of endocrine gland activity and immune function of an organism, avitaminosis and some other. In most cases hypo-menstrual syndrome is met during puberty and climacteric period. Pulsed magnetic therapy by the device POLIMAG-01 is recommended as one of components of complex therapy.

It may be primary and secondary. Primary hypo-menstrual syndrome is characterised with scanty and rear menses at the begging of sexual maturity. The reason – decreased ovaries function alongside with sexual genital infantilism. It is secondary when it is developed as a result of inflammatory diseases, chronic infection, intoxications.

With hypo-menstrual syndrome treatment is carried out in the cases when there are neuro-vegetative abnormalities and especial with hormonal barrenness.

The recommended treatment: hormonal medication, the balanced diet, correct interchange of work and rest, physio-therapeutic procedures for normalization of function of the endocrine organ, in particular, application of pulsed magnetic therapy is of great importance.

**Curative effect.** To create favorable conditions for ovaries functioning due to improvement of micro-circulation and metabolic processes in them, to stimulate hormonal function of ovaries, to make immune-modulating action on the disturbed immune function of an organism.

**Treatment procedure.**

Three basic emitters are applied. One is set on the cervico-collared zone, the second on the lumbosacral area, the third one on the stomach bottom, pelvic. Inductors polarity – "N" toward the patient body. Magnetic field type – "fixed" pulsating, discontinuous mode (see fig. 18). Frequency - 5 Hz, magnetic induction intensity - 2-4 mTl, magnetic field pause frequency rate - 1-2 sec., procedure time - 30 min. After 6-8 procedures there is transition to " traveling " magnetic field mode in the direction from left to right, frequency - 5 Hz, magnetic induction intensity - 10-20 mTl., procedure time - 30 min. The course of treatment - 8-10 procedures. The course of treatment is to be repeated 1-2 times a year.

## 1. APPLICATION OF POLYMAG-01 DEVICE FOR TREATMENT OF IMMUNODEFICIENCY CONDITION AT PATIENTS WITH MALIGNANT DISEASES ON THE BACKGROUND OF RADIAL THERAPY

As a result of radial chemotherapy application there are complications (radial burns, inflammatory reactions, depression of immune function) at all patients and this case application of a magnetotherapy is much more expedient.

In Ryazan medical university experimental tests of pulsed magnetic fields exposure on white outbred rats immune function. Under the exposure of magnetic field there was marked, on one side, the restoration of the quantity of leucocytes up to normal numbers by the 16th day. As a result of two side magnetic field exposure restoration appeared by 12 day and was kept within the limits of norm up to 30 days. In control animals group (without application of a magneto-therapy) immune function (cellular immunity) has been restored by 30 day and later from the moment of taken radiation.

On the basis of taken results, magnetic therapy has been applied on 32 patients with malignant neoplasms of dairy Ferri lactas who had taken radial therapy prior and after operation of swelling ablation. As complications in the radiation zone there were observed skin radial affection, post operation lymphorrhagia, depression both of cellular and humoral immunity (leukopenia up to 2,2-2,6x10 / 9 l, reduction of T- lymphocyte level, immune-globulin A)

**Curative effect.** After application of general magneto-therapy with rotating magnetic field by 10-12 procedures there were evident positive results: radio-reaction was regressed, the postoperative lymphorrhea was stopped, the level of leucocytes was up to 4x10/9 l, T - helper activity grew up. By 20th magneto-therapy procedure and the termination of radial therapy the quantity of leucocytes came nearer to norm, the level of A immune-globulin was normalized. The total number of procedures in prior -and - postoperative periods was 20-25 sessions.

**Treatment procedure.**

Inductors were set around body so that to make maximal exposure of magnetic field on lymph nodes. See fig. 26.

Exposure mode: magnetic field parameters: "dextrorotatory (right-hand) horizontal", frequency - 100 Hz, magnetic induction intensity -2 mTl., procedure time- 30-40 min., the course of treatments includes 12-15 procedures.

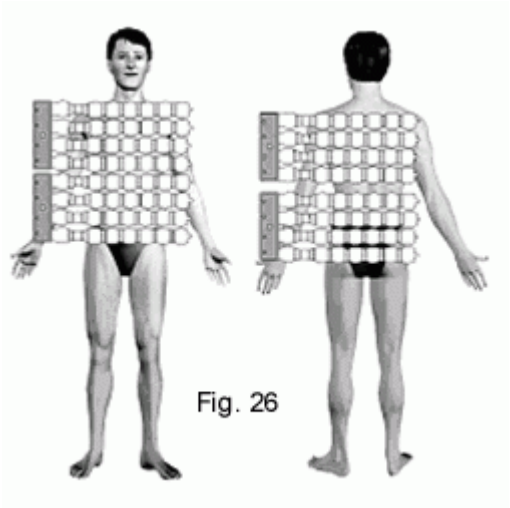

Fig. 26

So pulsed magneto-therapy is an effective method of organism immune function abnormalities regulation. Magneto therapy curative effect: eliminate (remove) radial reaction on cutaneous covering and mucous membranes, arrest postoperative lymphorrhea in earlier period. Application of magneto-therapy is indicated on a background of application of radial therapy which depresses the growth of malignant tissue cell.