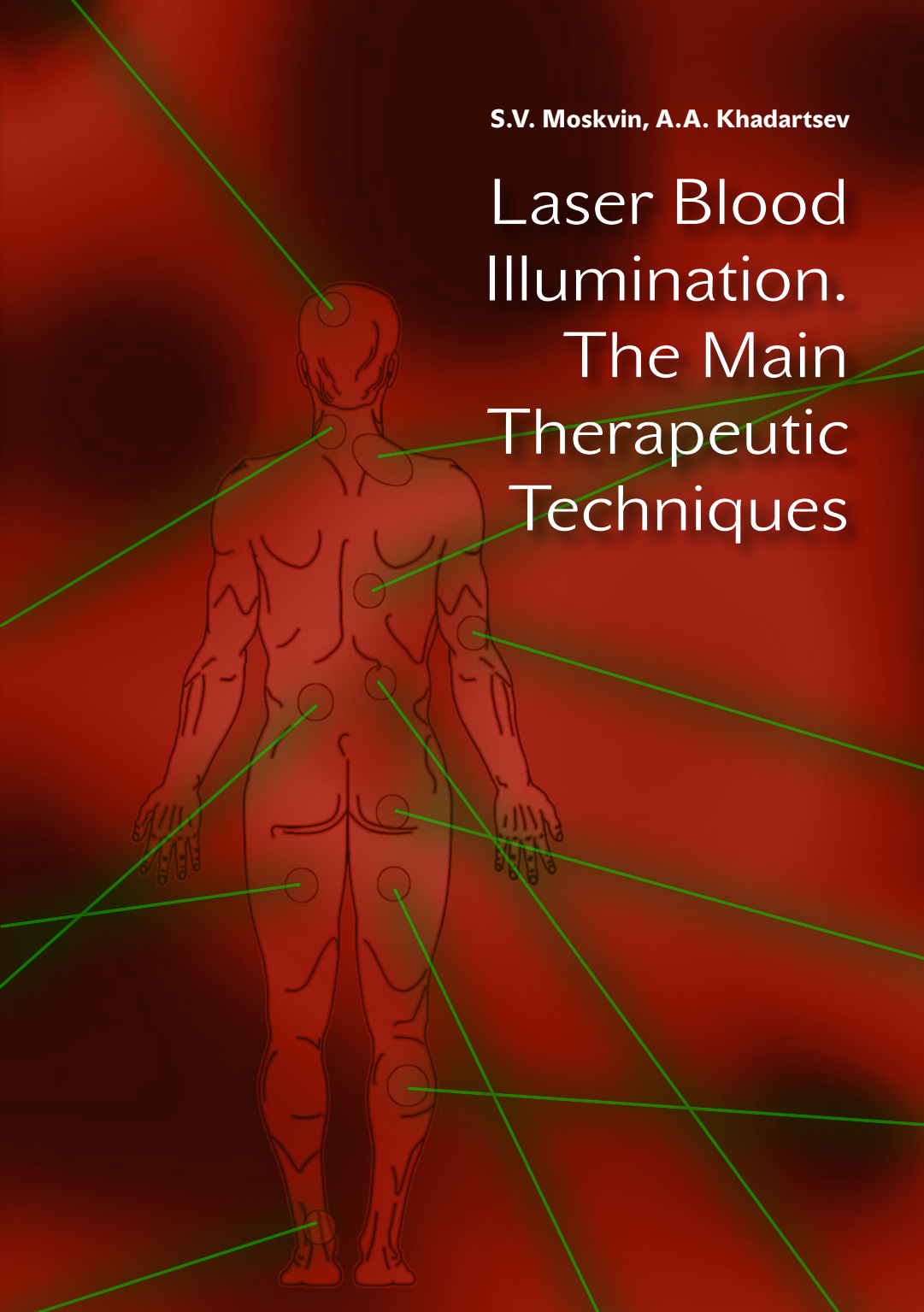
S.V. Moskvin, A.A. Khadartsev

Laser Blood Illumination. The Main Therapeutic Techniques



S.V. MOSKVIN, A.A. KHADARTSEV

LASER BLOOD ILLUMINATION. THE MAIN THERAPEUTIC TECHNIQUES

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The analysis of the publications devoted to the research of the mechanisms of the therapeutic effect of one of the most known low level laser therapy techniques – laser blood illumination, as well as the analysis of its long application experience allow us to speak with confidence about the prospects of this trend. Moreover, both methods: intravenous laser blood illumination (ILBI) and non-invasive laser blood illumination (NLBI) are developing independently, since each method has its own advantages and disadvantages.

The replacement of UV blood illumination with UV lamps by laser ultraviolet blood illumination (LUVBI®) has significantly simplified the technique and increased its efficiency. The most efficient options for ILBI are combined techniques: ILBI-635 + LUVBI® and ILBI-525 + LUVBI®. The most efficient technique for NLBI is the use of low-intensity pulsed laser light with a wavelength of 635 nm and power of up to 40 W.

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ABBREVIATIONS

AOS	–	antioxidant system
AP	–	acupuncture point
CCBI	–	chronic cerebrovascular ischaemia
CCI	–	craniocerebral injury
CI	–	confidence interval
CIC	–	circulating immune complexes
CVI	–	chronic venous insufficiency
DEP	–	dyscirculatory encephalopathy
DMW	–	decimeter waves
EAC-RFC	–	EAC-rosette forming cells of erythrocyte (E) – antibody (A) – complement (C) complex;
ED	–	energy density
EH	–	essential hypertension
NLBI	–	non-invasive (external, extravenous, transcutaneous, percutaneous) laser blood illumination
GAr	–	gonarthrosis (arthrosis of the knee)
HDL	–	high density lipoproteins
ILBI	–	intravenous laser blood illumination
IR	–	infrared (spectrum, band)
LDL	–	low density lipoproteins
LLLT	–	low level laser therapy
LILI	–	low-intensity laser illumination
LPO	–	lipid peroxidation
LUVBI®	–	laser ultraviolet blood illumination
MAH	–	major arteries of the head
MFPS	–	myofascial pain syndrome
MLLLT	–	magnetic low level laser therapy
MSS	–	musculo-skeletal system
OA	–	osteoarthrosis
OP	–	osteoporosis
PD	–	power density
PMF	–	permanent magnetic field
PsA	–	psoriatic arthritis
RA	–	rheumatoid arthritis
RCT	–	randomized controlled trial
TC	–	total cholesterol
TG	–	thermography
TPT	–	therapeutic physical training
USDG	–	ultrasonic Doppler examination
UST	–	ultrasound therapy
UV	–	ultraviolet (spectrum, band)
UVBI	–	ultraviolet blood illumination
VBI	–	vertebrobasilar insufficiency
WMD	–	weighted mean difference

INTRODUCTION

Laser was used in ancient Rome for coughing, during various infections and intestinal diseases as a stimulator and hypotensive agent. The fruits were also used in preparing a special kind of sausage, meat dishes and compote. This is, of course, referring to grass – *trilobate laserwort* – and its Latin name. We know the word laser (LASER) more commonly as an abbreviation composed of the initial letters of the English phrase: Light Amplification by Stimulated Emission of Radiation. The greatest invention of the 20th century appeared thanks to Russian scientists, laureates of Nobel Prize in Physics, N.G. Basov, A.M. Prokhorov and American C.H. Townes (1964). Later in 2000's, the Nobel Prize was awarded to Z.I. Alferov for the studies that formed the development of diode lasers. It is now impossible to imagine any science and technology industry where lasers are not used.

More than 50 years ago, laser light began to be used as a highly effective therapeutic agent in Russia for the first time. Today, low level laser therapy (LLLT) is developed through the efforts of mostly Russian scientists and doctors, but it is becoming more widespread and recognized in other countries. For several decades, hundreds of treatment techniques and relapse prevention of various diseases in almost all areas of medicine have been developed in Russia. Therefore, it can be said that we have the most effective LLLT techniques and the best equipment in the world – we can be proud of our achievements!

The basis of the therapeutic effect of low-intensity laser illumination (LILI) is a thermodynamic launch of Ca^{2+}-dependent processes. This has allowed us to have a new look, not only at the problem of increasing the effectiveness of low level laser therapy, but also to look at the methodological approaches of the choice of treatment strategies as a whole. Now there is a deep scientific basis, which describes in detail the processes occurring in the absorption of low-intensity laser light, and we were able to develop the technology of low level laser therapy while abiding to a strict compliance with a certain sequence of operations, setting an initial set of parameters that almost certainly guarantee to provide the desired therapeutic effect. This allows professionals to understand how and what characteristics of the technique (wavelength, power and pulse repetition frequency of LILI, laser operational mode, exposure and localization) should be varied to enhance the effect.

Low level laser therapy is one of the methods of physiotherapy which gained its popularity in the USSR first and then in Russia. In the English-speaking publications devoted to the subject, it is stated that the Hungarian researchers were the first to suggest the method [Mester E. et al., 1968]. However, dozens of studies on the therapeutic application of low-intensity laser irradiation (LILI) were carried out in a number of former Soviet Republics at that time and hundreds of articles and even monographs were published, but as they were all written in Russian language, they were ignored by the global professional community. It is undeniable that at the moment Russia is the main leader in this field, as it is Russian specialists who create the most efficient techniques of laser therapeutic effect.

The absolute safety of low level laser therapy and its efficiency were proven long ago [Kapustina G.M. et al., 1996; Moskvin S.V., 1997], the mechanisms of the therapeutic (biological) effect of low-intensity laser irradiation (LILI) have been studied thoroughly [Moskvin S.V., 2003; 2008], which makes it possible to develop the trend more actively in general together with its different techniques in particular.

One of the most famous low level laser therapy techniques is laser blood illumination [Moskvin S.V., 2014; 2016; Laser therapy…, 2015] which is implemented in two options: invasive (intravenous) and non-invasive (transdermal). Intravenous laser blood illumination (ILBI) was first applied in clinical practice (cardiology and cardiac surgery) by E.N. Meshalkin and V.S. Sergievsky (1981, 1989) with the help of HeNe lasers with a wavelength of 633 nm and power of 1–2 mW, but nowadays LILI is applied with different wavelengths (from UV to IR spectrum) and power of 1–2 to 25 mW [Geynits A.V., Moskvin S.V., 2009; Geynits A.V. et al., 2012]. Pulsed laser diodes (LD) of red spectrum (wavelength of 635 nm, pulse duration of 100–150 ns, pulse power of 5 W for a single LD and up to 40 W for a matrix of 8 LDs) are more often used for non-invasive laser blood illumination (NLBI), particularly matrix LD [Zhukov B.N. et al., 2003; Moskvin S.V. et al., 2007]0.

The number of areas of application of laser blood illumination for therapeutic effects is increasing:

- obstetrics and gynecology [Fedorova T.A. et al., 2009];
- dermatology and cosmetology [Geynits A.V., Moskvin S.V., 2010];
- neurology [Kochetkov A.V., Moskvin S.V., 2004; Kochetkov A.V. et al., 2012];

– otorhinolaryngology [Nasedkin A.N., Moskvin S.V., 2011][0];
– pediatrics [Moskvin S.V. et al., 2009];
– psychiatry [Nasedkin A.A., Moskvin S.V., 2004];
– dentistry [Amirkhanyan A.N., Moskvin S.V., 2008];
– urology [Ivanchenko L.P. et al., 2009] etc.

The techniques of laser blood illumination are constantantly being improved. The interest in these Russian medical technologies has increased all over the world recently, but the article deals with their main options only and the number of their modifications can be fairly great. But let us take two things into account. First of all, extracorporeal blood illumination was applied only with the use of non-coherent light sources (lamp), laser light energy delivery is implemented much more easily – intravenous (through the light guide) and non-invasive (transdermal). Secondly, NLBI is always about the impact over large blood vessels. Irradiation of peripheral vessels in any localization like "laser watch" on the wrist [Litscher G., Litscher D. et al.] or endonasal [Liu T.C.Y. et al., 2010] (Chinese versions) is a mere discredit of the method [Moskvin S.V., 2016].

The authors hope that this book will help in daily work, and any questions can be emailed to: 7652612@mail.ru.

MECHANISMS OF THE THERAPEUTIC EFFECT & EQUIPMENT FOR LOW LEVEL LASER THERAPY

To understand the improvement strategy of low level laser therapy techniques with the aim to increase their efficiency it is necessary to know the mechanisms of LILI biomodulation action, which can be presented in the following sequence: as a result of irradiation a temperature gradient occurs inside a cell and there is a momentary increase of the concentration of calcium ions (Ca^{2+}) released from intracellular stores, with the development of the cascade of the organism's responses to the external influence: the work of immune system and vascular system normalizes, metabolic and proliferative processes are activated, analgesic effect is provided, etc. (Fig. 1) [Moskvin S.V., 2003, 2008, 2017]. It is necessary to take into consideration the fact that all laser-induced bioeffects are Ca^{2+}-dependent, that explains non-specificity and versatility of the living organism's responses. The nonlinear nature of the relations "energy density of LILI – effect" and "exposure (irradiation time) – effect" is due to the peculiarities of work of intracellular calcium stores, and the lack of action spectrum (specific

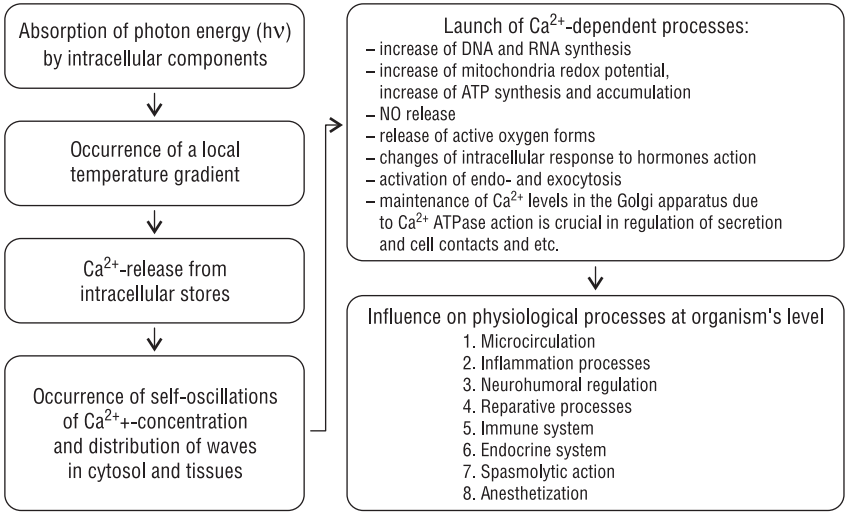

Fig. 1. The sequence of the development of biological effects due to laser irradiation

LILI wavelength dependence) is due to the thermodynamic nature of their inclusion (launch of the process of calcium ions release).

Let us pay attention to the fact, that all the aforementioned is only relevant to "*laser*-" biomodulation, not "photo-" or "light-" biomodulation, that is true only for monochromatic *laser* light. In *laser* therapy (low level *laser* therapy) only *lasers* or *laser* diodes (LD) are used. Unfortunately, *laser* diodes are quite often substituted with inefficient, almost useless but cheap *light-emitting* diodes (LED), which is totally unacceptable.

Correct understanding of the mechanisms of LILI biomodulation action makes it possible to work out recommendations for efficient low level laser therapy application and creates the basis for development of new techniques.

In modern laser therapeutic equipment, laser diodes which allow the use of remote laser emitting heads customized according to the delivery methods are most often used. Devices of "LASMIK" (Fig. 2) series allow

Fig. 2. Laser therapy device "LASMIK" can be used for ILBI as well as NLBI

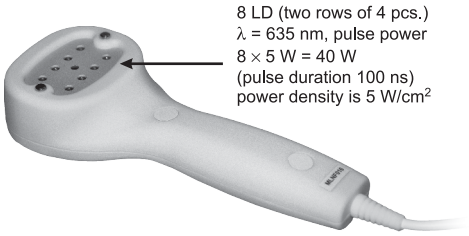

Fig. 3. Matrix laser emitting head ML-635-40 for efficient NLBI

intravenous and non-invasive laser blood illumination, as well as other techniques of laser treatment. Maximum therapy efficiency is also due to the optimization of the laser head design, for example, a special fixing system of disposable light guides and heads on the arm is used for ILBI (Fig. 2, bottom left), matrix emitting heads are used for NLBI (Fig. 2, bottom right, Fig. 3).

PROTOCOL REQUIREMENTS OF LOW LEVEL LASER THERAPY PROCEDURES IN RUSSIA, LOW LEVEL LASER THERAPY TECHNIQUES

Protocol requirements are strictly obligatory as the necessity to set *all* the parameters of the method listed below has been clearly proven. It will be impossible to get a predictable and appropriate response to the laser light impact and to achieve the desired therapeutic effect if only one of the parameters is implemented incorrectly.

Let us take into account the fact that in most cases minimum LILI energy is required for the successful implementation of low level laser therapy techniques. However, there are techniques which require power density limits, but there are not so many of them.

All low level laser therapy techniques must contain the following information [Moskvin S.V., 2014, 2016, Laser therapy…, 2015].

1. Laser light wavelength is measured in nanometers [nm]. Here are the wavelengths which are the most common in laser therapy:
   – 365–405 nm – ultraviolet (UV) spectrum,
   – 440–445 nm – blue spectrum,
   – 520–525 nm – green spectrum,
   – 635 nm – red spectrum,
   – 780–785 nm – infrared (IR) spectrum,
   – 890–904 nm – infrared (IR) spectrum.

It is not allowed to irradiate the same area with laser and/or incoherent light sources with a different wavelength simultaneously because of inhibitory interaction.

2. Laser operation mode: continuous, modulated, pulse.

3. LILI radiation power.

The average power of continuous lasers, operating in continuous or modulated modes is measured in milliwatts (mW), pulse (peak) power of pulsed lasers is measured in watts (W).

4. Modulation frequency or pulse for a pulsed mode is a quantity of fluctuations (pulses) per a unit of time (second). It is measured in Hertz [Hz, 1/s].

5. The duration of light pulse is a very important parameter for pulsed lasers, it is constant (most often 100–150 ns). Average power of pulsed lasers ($P_{av.}$) is directly proportional to pulse power (P_p), pulse duration (τ_p) and frequency (F_p): $P_{av.} = P_p \times \tau_p \times F_p$.

6. Irradiation area. It is measured in square centimeters [cm^2].

The required area is almost always defined by the technique itself without unnecessary measurements, for example, for a contact-mirror technique the area is supposed to be 1 cm^2. Laser diodes in matrix emitters must be arranged so that their impact area is multiplied by power density. For example, 8 (most often) pulsed laser diodes, each with the power of 10 W, are placed on the area of 8 cm^2, and upon the contact with the skin the power density will be 10 W/cm^2 respectively. For laser acupuncture or intravenous laser blood illumination (ILBI) the area is not indicated, because the impact area is too small and dispersion and absorption of the laser light energy in the volume of biological tissues are of primary importance.

7. Power density (PD). It is measured in watts and milliwatts per a square centimeter [W/cm^2 or mW/cm^2].

8. Exposure (exposure time) on one area (zone) and total duration of the procedure is measured in seconds [s] or minutes [min]. This is an extremely important parameter which can hardly ever be changed. Total duration of the low level laser therapy procedure (consistent effect on all the areas) should not exceed 20 minutes, for one area – 5 minutes (except for intravenous laser blood illumination).

9. Exposure localization (technique).

10. The number of procedures per course of treatment and their frequency.

Calculations of energy measured in joules [J or W·s] and energy density [J/cm^2 or $W·s/cm^2$] are not carried out as there is no need in this information for an efficient laser therapy.

It is expedient to include one of the general effect methods into a low level laser therapy scheme (laserpuncture and/or ILBI) and direct impact on the affected area (local, transdermal or abdominal technique, and a combined method – laser phoresis).

Local LILI is applied directly on the affected area located close to the surface of a body or contact through a mirror head, or remote at a small distance from the surface (1–2cm) in a stable manner.

The following types of LILI are most often used for local laser irradiation:

- continuous LILI of red spectrum (635 nm), PD – 10–15 mW/cm^2,
- pulsed LILI of red spectrum (635 nm), PD – 4–5 W/cm^2, pulse duration 100–150 ns, frequency 80–10 000 Hz,

– pulsed IR LILI (890–904 nm), PD – 8–10 W/cm^2, pulse duration 100–150 ns, frequency 80–10 000 Hz.

For pulsed lasers, frequency varies according to the desired effect: regeneration and anti-inflammatory effect – 80–150 Hz, anesthesia – 3000–10 000 Hz. There are up to 2–3 local zones for one area, exposure to each is 2–5 min. A more than a five-minute exposure to one zone is not allowed.

INTRAVENOUS LASER BLOOD ILLUMINATION

A continuous mode LILI is used, the exposure is implemented intravenously through special disposable sterile light guides with a puncture needle (Fig. 4), most often in cubital vein (Fig. 5 and Fig. 6, zone 1) [Geynits A.V. et al., 2012].

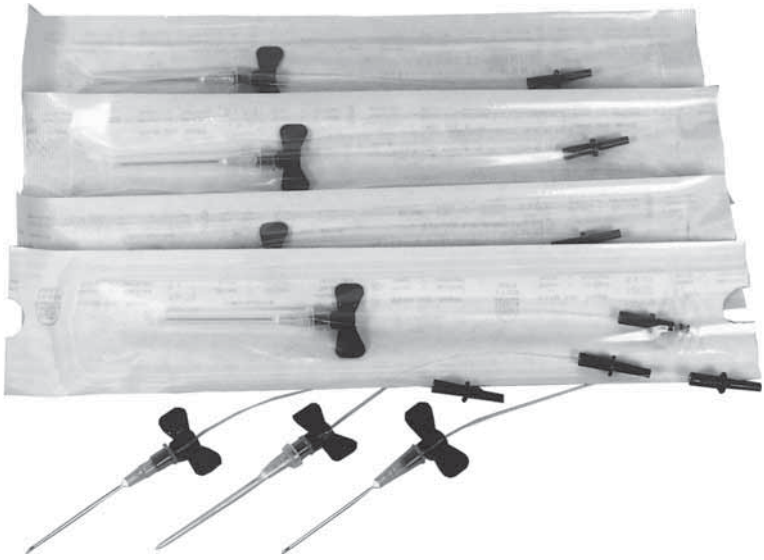

Fig. 4. Disposable sterile light guides for ILBI

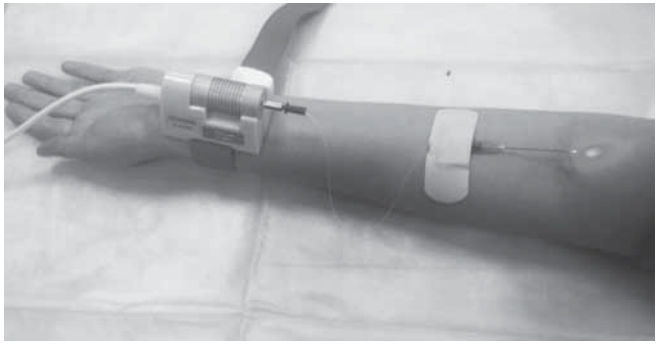

Fig. 5. ILBI procedure

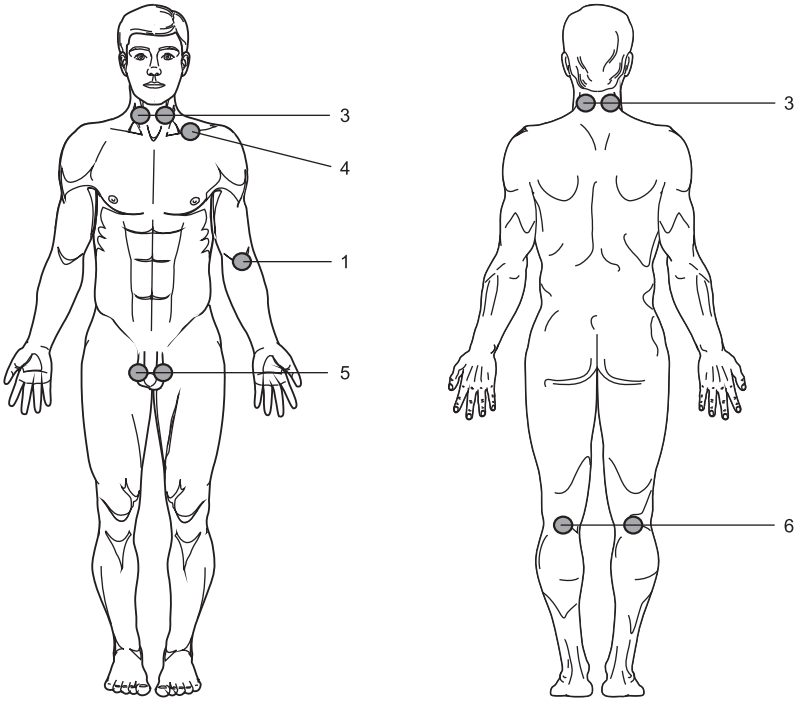

Fig. 6. Main areas of laser blood illumination

Differentiated techniques with the use of laser light of different spectrum (Table 1) are used at the present time for ILBI implementation:

ILBI-635 (wavelength of 635 nm, red spectrum, power of 1.5–2 mW, exposure 10–20 min) has a universal effect, a positive effect on the immune system as well as on the trophic provision of tissues.

ILBI-525 (wavelength of 525 nm, green spectrum, power of 1.5–2 mW, exposure 7–8 min) is recommended for maximum enhancement of the trophic provision of tissues.

ILBI-365 and ILBI-405 – laser ultraviolet blood illumination (LUVBI®, wavelength of 365–405 nm, power of 1,5–2 mW, exposure 3–5 min) is preferable for the correction of immune disorders as a result of a disease or injury.

There are many options of the techniques and the rules of parameter variation which must not be broken.

Table 1

ILBI-635 («classical», basic), ILBI-525, ILBI-365, ILBI-405 (LUVBI®) Techniques

Parameter	Value	Note
Laser light wavelength, nm (spectrum)	635 (red)	ILBI-635
	525 (green)	ILBI-525
	ILBI-365 (ultraviolet)	LUVBI®
	ILBI-405 (violet)	
Laser operation mode	Continuous	–
Irradiation power*, mW	1,5–2	At the output of a disposable light guide
Exposure, min	10–20	ILBI-635
	7–8	ILBI-525
	3–5	LUVBI®
	3–5	
Localization	Median cubital vein (*v. mediana cubiti*)	Fig. 6, zone 1 (in the left or right arm)
Technique	Intravenously	Through a disposable sterile light guide
Number of procedures per course of treatment	10–12	–

Power (1,5–2 mW) is not changed, but can be increased up to 20–25 mW in some cases with the use of special laser emitting heads or is changed from one procedure to another. But it is necessary to be extremely careful with this regulation and use it only on purpose and for some nosological forms only.

Exposure. "Standard" time for ILBI-635 procedure can be increased, sometimes to 25–30 minutes, but not more [Meshalkin E.N., Sergievsky V.S., 1989]! It is necessary to know the peculiarities of ILBI-635 application in the older age group (2 times decrease of the exposure) [Davydenko T.E., 2006][0]. There is a rule in pediatrics "the younger the age the less the exposure" [Moskvin S.V. et al., 2009; 2010], for ILBI-635 the exposure is decreased to 5–7 min, though we are sure, that for children it is almost always possible to substitute the intravenous technique with the external irradiation of the supraclavicular area.

Now combined techniques ILBI-525 + LUVBI® (Table 2) and ILBI-635 + LUVBI® (Table 3) are gaining more and more popularity. We emphasize the fact that irradiation is implemented every other day, it is strictly PROHIBITED to implement ILBI with a different wavelength for the same patient on the same day, especially simultaneously.

Table 2

ILBI-525 + LUVBI® (basic) Technique

Parameter	Value	Note
Laser light wavelength, nm (spectrum)	365–405 (UV)	LUVBI®
	520–525 (green)	ILBI-525
Laser operation mode	Continuous	–
Irradiation power *, mW	1,5–2	At the output of a disposable light guide
Exposure, min	3–5	LUVBI®
	7–8	ILBI-525
Localization	Median cubital vein (*v. mediana cubiti*)	Fig. 6, zone 1 (in the left or right arm)
Technique	Intravenously	Through a disposable sterile light guide
Number of procedures per a course of treatment	10–12	Daily, alternating ILBI-525 and LUVBI® every other day

Table 3

ILBI-635 + LUVBI® Technique

Parameter	Value	Note
Laser light wavelength, nm (spectrum)	365–405 (UV)	LUVBI®
	635 (red)	ILBI-635
Laser operation mode	Continuous	–
Irradiation power*, mW	1,5–2	At the output of a disposable light guide
Exposure, min	3–5	LUVBI®
	10–20	ILBI-635
Localization	Median cubital vein (*v. mediana cubiti*)	Fig. 6, zone 1 (in the left or right arm)
Technique	Intravenously	Through a disposable sterile light guide
Number of procedures per a course of treatment	10–12	Daily, alternating ILBI-635 and LUVBI® every other day

Alternating the procedures allows optimization of the effect on the immune system on the days when LUVBI® is implemented as well as the trophic provision of tissues on the days when ILBI-635 or ILBI-525 are implemented (more efficient option).

NON-INVASIVE LASER BLOOD ILLUMINATION

It is implemented over *large* blood vessels (arteries and veins) close to the injury area. Pulsed lasers of red (635 nm) or infrared (890–904 nm) spectrum and matrix (8 laser diodes) emitters with irradiation areas of 10 cm^2 (Fig. 3), or as an option, with a single laser with a mirror head with irradiation area of 1 cm^2 are used for NLBI. The power density is identical in any case. [Moskvin S.V. et al., 2007] (Table 4):

– NLBI-635, the most effective option, pulsed LILI of red spectrum (635 nm), PD – 4–5 W/cm^2, pulse duration 100–150 ns, frequency 80 Hz,
– NLBI-904, pulsed IR LILI (890–904 nm), PD – 8–10 W/cm^2, pulse duration 100–150 ns, frequency 80 Hz.

Table 4

NLBI Technique

Parameter	Value	Note
Laser light wavelength, nm (spectrum)	635 (red)	NLBI-635
	904 (infrared)	NLBI-904
Laser operation mode	Pulsed	–
Light pulse duration, ns	100–150	–
Irradiation power, W	30–40	Matrix emitting head, NLBI-635
	60–80	Matrix emitting head, NLBI-904
Power density, W/cm^2 (surface area of 10 cm^2)	3–4	NLBI-635
	6–8	NLBI-904
Frequency, Hz	80–150	–
Exposure on 1 zone, min	2–5	–
Number of zones	2–4	Symmetrically
Localization	On the projection of large blood vessels close to the lesion area	See the text
Technique	Contact	Through a transparent nozzle
Number of procedures per a course of treatment	10–12	Daily

The following irradiation localizations are used for NLBI (Fig. 6):

– the projection of the common carotid artery (carotid sinus area) symmetrically (zone 2),

– the projection of the vertebral artery symmetrically (zone 3),
– supraclavicular area on the left (zone 4),
– vascular bundles in the groin area symmetrically (zone 5);
– popliteal symmetrically (zone 6).

Pulse is fixed (80–150 Hz), the problem of the possibility and permissibility of the frequency increase (the average power for pulsed lasers) has not been studied yet. It is recommended to irradiate symmetric zones with the exposure time of 2–5 min. on each zone. It is prohibited to irradiate one zone for more than 5 min!

The main advantages and disadvantages of the two techniques of the blood illumination are briefly presented in Table 5.

Table 5

Intravenous and Non-invasive Techniques Comparison

Parameter	ILBI-635	NLBI-635
Low cost	No	Yes
The simplicity of realization	No	Yes
The potential for infection	Yes	No
Supplies	There are	No
Localization of the irradiation	Median cubital vein (*v. mediana cubiti*)	On the projection of large blood vessels (arteries or veins) close to the lesion area
Exposure, min	2–30	Not more than 5
Trauma	Yes	No
Additional requirements to the room, where the procedure is implemented	Yes	No
Efficiency	Less	More
Time of the procedure, min	7–30 (average 15)	2–5
Additional psychological effect	There is	No

The analysis of the publications devoted to the research of the mechanisms of the therapeutic effect of one of the most known low level laser therapy techniques – laser blood illumination, as well as the analysis of its long application experience allows us to speak with confidence about the prospects of this trend. Moreover, both methods: intravenous laser blood illumination (ILBI) and non-invasive laser blood illumination (NLBI) are developing independently, since each method has its own advantages and disadvantages.

The replacement of UV blood illumination with UV lamps by laser ultraviolet blood illumination (LUVBI®) has significantly simplified the technique and increased its efficiency. The most efficient options for ILBI are combined techniques: ILBI-635 + LUVBI® and ILBI-525 + LUVBI®. The most efficient technique for NLBI is the use of low-intensity pulsed laser light with a wavelength of 635 nm and power of up to 40 W.

SPECIAL TECHNIQUES OF LOW LEVEL LASER THERAPY

Obstetrics and Gynecology

Acute Bartholinitis (in the Infiltration Phase), Subacute and Chronic

Contraindications: acute bartholinitis in the stage of abscessing, festering cysts of the Bartholin's glands (when cysts and recurrent pseudoabscesses of the large gland of the vestibule occur, LLLT is recommended in the preoperative preparation plan [3–5 procedures], thus, the period of healing of the postoperative seam is accelerated, and the percent of postoperative suppurations is decreased).

ILBI technique (Table 2 or 3), there are 5–7 daily procedures per course.

LLLT technique of 3–5 daily procedures per course (refer to the book Moskvin S.V., Khadartsev A.A., 2017).

Coleitis, Cervicitis (Endocervicitis)

Indications: subacute and chronic serous-purulent, fungoid, senile colpitis, herpetic colpitis. LLLT of senile colpitis is the most effective. With all kinds of colpites, LLLT is implemented alongside standard medication with a daily vaginal sanitation before the procedure.

ILBI has an immunomodulatory and anti-inflammatory effect, it stimulates the microcirculation and regeneration processes, it is implemented by any of the combined options (Table 2 or 3). In addition, the direct exposure of the eroded surface of the cervix is implemented daily (refer to the book Moskvin S.V., Khadartsev A.A., 2017).

Endometriosis

ILBI technique (Table 1), the duration of ILBI-635 (wavelength is 635 nm) procedure is increased up to 30 minutes. There are 5–7 daily procedures per course in the lutein phase of the cycle [Mallak I.K., 1995].

Fetoplacental Insufficiency

O.A. Vasilyeva (1998, 2006) considers ILBI to be very important in combined low level laser therapy (additionally, the external exposure with pulsed IR LLLT on the projection of the uterine and the appendages

alongside the taking of medicines) in the system of health improvement of the fetus and newborn at pregnancy with fetoplacental insufficiency. According to our data, complex treatment reduces the number of premature births from 66,7% to 17%, the number of cases of a long anhydrous period by 8.2 times, the number of abnormal births by 5.8 times while increasing the number of normal births by 1.8 times. ILBI-635 is also recommended for the prevention of perinatal complications of fetoplacental insufficiency [Kartelishev A.V. et al., 2004].

ILBI technique (Table 2 or 3), there are 5–7 daily procedures per course.

Late Toxemia of Pregnancy (EPH-Gestosis)

ILBI technique (Table 2 or 3), there are 5–7 procedures per course, every day or every other day.

Nonspecific Salpingitis and Salpingoophoritis (Subacute and Chronic)

Low level laser therapy implementation with the acute process is possible only after the end of the exudative inflammation phase. The treatment should be started at the end of the acute stage of inflammation, at the transition from the acute process to the subacute, from the exudative phase to the proliferative. It is necessary to empty the bladder before the procedure. The female patient should be placed on a couch in the supine position with her knees bent and pelvis up for the better accessibility to the appendages. The LLLT course is implemented alongside the use of standard medication [Fedorova T.A. et al., 2009].

Complex therapy of patients with acute salpingoophoritis together with the use of ILBI leads to reduce the treatment duration, to the normalization of the hemoglobin level, of the dry weight of red blood cells and of the indicators of their osmotic resistance, of the quantity of normal discocytes, and of the size of the central depression of erythrocytes. With the help of these mechanisms local physiological processes are realized, the activation of microcirculation and the enhancement of tissue oxygenation in particular, which, in its turn, leads to the increase of the intensity of energy, synthetic and proliferative processes in blood cells and tissues [Davydova Yu.G., 1996].

ILBI technique (Table 2 or 3), there are 5–7 daily procedures per course.

Prevention of Postoperative Complications

ILBI technique (Table 2 or 3), there are 5–7 daily procedures per course.

Purulent-Septic Complications

ILBI is recommended in any of the combined options (Table 2 or 3) to women both not pregnant and during pregnancy with a high risk of the development of pyo-inflammatory complications:

- with chronic salpingo-oophoritis, endometritis, colpitis;
- having surgery in the anamnesis, birth complications due to pyo-inflammatory diseases;
- having chronic viral infections, suffering from miscarriages, having premature birth in the anamnesis, pre-natal destruction of fetuses or birth of children with pre-natal infections.

For relieving the inflammation process in the genitals genitals and the pelvic organs caused by a cytomegalovirus infection of the urogenital tract, at its reactivated current, a combined option of ILBI (Table 2) is implemented alongside antiviral therapy. There are 15 procedures per course, 8 LUVBI® procedures and 7 ILBI-525 procedures, alternating every other day [Patent 2513474 RU].

Some Types of Infertility, Ovarian Hypofunction, Some Forms of Diencephalic Pathology and Hypothalamo-Pituitary Disorders

ILBI has an immunomodulatory and anti-inflammatory effect, blood rheology is improved, metabolic processes and body defenses are normalized. In 2–3 months after the course of LLLT, women's menstrual cycles and hormonal disorders are normalized, in half the cases the degenerative changes of the nuclear material disappear and the number of oocytes with a normal structure is increased [Ivanyuta L.I. et al., 2001].

ILBI technique (Table 2 or 3), there are 5–6 daily procedures per course of treatment, beginning on the 7th day of the cycle.

Dermatology

Acne

ILBI technique (Table 2 or 3), there are 7–10 daily procedures per course.

Laser acupuncture, successively on the points: GI4, E40, P5, RP10, V13, E25, TR6.

Locally, on lesions (refer to the book Moskvin S.V., Khadartsev A.A., 2017).

Alopecia

ILBI technique (Table 2 or 3), there are 15–20 daily procedures per course.

Locally, on lesions (refer to the book Moskvin S.V., Khadartsev A.A., 2017).

Erysipelas

Low level laser therapy, which has a positive influence on the immune system and blood rheology, is advised for the treatment of patients with erysipelas. We have shown that the combined external exposure together with ILBI allows the enhancing of tissue blood flow, restoring vascular tone and reactivity alongside the activation of cellular immunity, which, in the aggregate, makes the number of recurrences 7–8 times less [Egorov V.E. et al., 1997].

With the ILBI technique (Table 2 or 3), there are 5–7 procedures (sessions) per course – additionally to technique 2 or 3 (refer to the book Moskvin S.V., Khadartsev A.A., 2017).

Eczema

In treatment of patients with eczema, ILBI leads to the reduction of the ATP heightened before the treatment, of the erythrocyte membranes, to the elimination of the tissue hypoxia and to the normalization of the activity of alkaline and acid phosphatase in the peripheral blood neutrophils [Isakov S.A., 1994].

ILBI technique (Table 1), power at the light guide end for ILBI-635 is 5.0–7.0mW, the time of the procedure is 30–60 minutes. There are 8–12 daily procedures per course [Plotnikov A.V., 1991].

Localized Scleroderma

There are 10–12 daily procedures per course of treatment. The repetitive courses (no less than 2–3) are advised to be done in 3–4 weeks [Podelinskaya L.V., 1996].

NLBI-635 (Table 4, wavelength is 635nm) on the projection of the vascular bundles (radial, femoral and popliteal arteries) for two minutes [Bakhmetyev A.A., 2002].

Lyell's Syndrome

ILBI technique (Table 1), the time of the procedure for ILBI-635 (wavelength of 635nm) is 30–60 minutes. There are 5–7 daily procedures per course [Toygabayev A.A. et al., 1989].

Pruritic Dermatitis (Atopic and Contact Dermatitis, Eczema, Lichen Planus, Localized Itching of the Skin)

The basic procedures (refer to the book Moskvin S.V., Khadartsev A.A., 2017) are concluded with ILBI (Table 2) [Patent 2562317 RU].

ILBI uses low-intensity continuous laser light of alternating wavelengths 365–405nm (UVA spectrum) and 520–525nm (green spectrum) with varying exposure for 12 daily sessions. The exposure conforms to the following schedule:

1st session – 365–405 nm, power 1–2 mW, exposure 2 minutes;
2nd session – 365–405 nm, power 1–2 mW, exposure 2 minutes;
3rd session – 365–405 nm, power 1–2 mW, exposure 2 minutes;
4th session – 520–525 nm, power 1–2 mW, exposure 7 minutes;
5th session – 365–405 nm, power 1–2 mW, exposure 3 minutes;
6th session – 520–525 nm, power 1–2 mW, exposure 10 minutes;
7th session – 365–405 nm, power 1–2 mW, exposure 3 minutes;
8th session – 520–525 nm, power 1–2 mW, exposure 10 minutes;
9th session – 365–405 nm, power 1–2 mW, exposure 2 minutes;
10th session – 520–525 nm, power 1–2 mW, exposure 7 minutes;
11th session – 365–405 nm, power 1–2 mW, exposure 2 minutes;
12th session – 520–525 nm, power 1–2 mW, exposure 5 minutes.

This method enables improving the treatment quality and efficacy of the patients with atopic dermatitis by the integrated effect on different links of the disease process.

Psoriasis

The procedures should be implemented in the afternoon. The courses should be repeated in 2 months. The total number of courses is 3–4.

It is ***strictly forbidden*** to drink alcohol or consume other inhibitors of catecholamine activity during the course of this treatment.

Technique 1. ILBI-635. A.I. Vilshonkov et al. (1997) proved that ILBI-635 (wavelength of 635 nm) with the increased power of LLLT is the most effective for patients with psoriasis arthropica. The activity of the antioxidant protection is increased, the barrier properties of erythrocyte

membranes are activated, the immunomodulatory effect is provided. On the first day the power is 1–2 mW, then the power is increased by 2 mW every day up to 18–20 mW at the last session. The total number of daily procedures is 10. The exposure of each session is 20 minutes.

Technique 2. ILBI combined [Patent 2562316 RU].

The sessions are daily, during the afternoon, for 15 days. The local exposure is carried out by a matrix emitter consisting of 8 laser diodes of the total surface area of 8 cm^2. The wavelength is 635 nm. The exposure time is two minutes per one area in pulsed contact mode. The light pulse length is 100–130 ns. The pulse power is 40 W at a varying frequency. ILBI is carried out by a continuous laser light at a wavelength of 525 nm with varying power and exposure. The exposure conforms to the following schedule:

1st session – local: frequency 80 Hz, ILBI: power 2 mW, exposure 5 minutes.

2nd session – local: frequency 150 Hz, ILBI: power 5 mW, exposure 7 minutes.

3rd session – local: frequency 600 Hz, ILBI: power 5 mW, exposure 12 minutes.

4th session – local: frequency 1500 Hz, ILBI: power 10 mW, exposure 15 minutes.

5th session – local: frequency 3000 Hz, ILBI: power 15 mW, exposure 15 minutes.

6th–7th sessions – local: frequency 6000 Hz, ILBI: power 15 mW, exposure 20 minutes.

8th–10th sessions – local: frequency 10,000 Hz, ILBI: power 20 mW, exposure 20 minutes.

11th–12th sessions – local: frequency 1500 Hz, ILBI: power 20 mW, exposure 20 minutes.

13th–15th sessions – local: frequency 80 Hz, ILBI: power 20 mW, exposure 20 minutes.

EFFECT: reducing the length of psoriasis treatment, prolonging remission that is ensured by the integrated effect on different links of the disease process.

Pyoderma

ILBI technique (Table 3), there are 10–12 daily procedures per course [Shulga V.A., 1995].

Recurrent Herpes Simplex

ILBI technique (Table 2 or 3), there are 7–10 daily procedures per course.

Locally, on lesions (refer to the book Moskvin S.V., Khadartsev A.A., 2017).

Skin Angiitis (Vasculitis)

The procedures (refer to the book Moskvin S.V., Khadartsev A.A., 2017) are ended with ILBI (Table 2).

Musculoskeletal Disorders

Low level laser therapy is advised in the subacute period of the disease process, the treatment is long (up to several years), the courses are 2 times a year, in the complex of therapeutic interventions. The course of treatment should be started 2 weeks before the expected exacerbation (spring – autumn) and it consists of 10–12 daily procedures. The second course can be implemented in 3 weeks. The total time of the session must not exceed 10 minutes. It is not necessary to try to expose all the affected joints during one session. It is reasonable to choose 2–3 joints disturbing the patient the most at that particular moment. The basic condition of successful treatment is the discharge and repose of the affected joint (using a cane while walking, limited mobility, immobilization).

In the treatment of the diseases of small hand and foot joints, they are exposed from the rear side in the point of maximum pain. Elbow, wrist, ankle joints are exposed from the flexion and extensor sides each. Shoulder, knee joints are exposed from three sides. Hip joints are exposed through the zone of the projection of the crural arch, trochanter and ischial tuberosity. The exposure by fields is implemented along the projection of the joint space (refer to the book Moskvin S.V., Khadartsev A.A., 2017).

Epicondylitis (Enthesopathy)

During the period of treatment and for two weeks after the end of the course of therapy, the patient is advised to limit physical stress on the affected limb as much as possible.

LLLT in the acute stage of the disease is combined with the limb repose and discharge. During the first three days it is reasonable to expose with the ML-904-80 matrix pulsed IR laser head (wavelength is 904nm, maximum power is 60–80 W, frequency is 3000–10,000 Hz), scanning along

the joint space at a distance for one minute. This is followed with the LO-904-20 pulsed IR laser head and the ZM-50 magnet nozzle (wavelength is 904nm, power is 10–15W, frequency is 80–150 Hz) on zones 1 and 4 for 1.5–2 minutes (refer to the book Moskvin S.V., Khadartsev A.A., 2017).

Low level laser therapy is implemented together with the elimination of the nidus. With the chronic form of the disease, massage and physical therapy are also prescribed. The second course of low level laser therapy is implemented in one month.

ILBI technique (Table 2 or 3), there are 5–7 daily procedures.

Osteoarthritis

The treatment is implemented alongside a healthy diet and medication.

LLLT technique is contact, stable (refer to the book Moskvin S.V., Khadartsev A.A., 2017).

ILBI technique (Table 2 and 3), there are 5–7 daily procedures.

Rheumatoid Arthritis

LLLT in the acute stage of the disease is combined with the limb repose and discharge. During the first three days it is reasonable to expose with the ML-904-80 matrix pulsed IR laser head (wavelength is 904nm, maximum power is 60–80 W, frequency is 3000–10,000 Hz), scanning along the joint space at a distance for one minute. This is followed with the LO-904-20 pulsed IR laser head and the ZM-50 magnet nozzle (wavelength is 904 nm, power is 10–15 W, frequency is 80–150 Hz) on zones 1 and 4 for 1.5–2 minutes (refer to the book Moskvin S.V., Khadartsev A.A., 2017).

Low level laser therapy is implemented together with the elimination of the nidus. With the chronic form of the disease, massage and physical therapy are also prescribed. The second course of low level laser therapy is implemented in one month.

ILBI technique (Table 2 or 3), there are 5–7 daily procedures.

Peripheral Vascular Disorders

Atherosclerotic Arteriopathy of the Lower Extremities

ILBI technique (Table 2 or 3), there are 7–10 daily procedures.

Additionally, to ILBI, beginning with the 3rd procedure, the exposure on the projection of the vessels of the inguinal and paravertebral area of

the lumbosacral spine is implemented with the LO-904-20 pulsed IR laser emitting head and the ZN-35 mirror nozzle (wavelength is 904 nm, power is 10–15 W, frequency is 80–150 Hz), for two minutes. There are 10 daily procedures per course (refer to the book Moskvin S.V., Khadartsev A.A., 2017).

Diabetic Angiopathy of Lower Extremities

ILBI technique (Table 2 or 3), there are 7–10 daily procedures.

Additionally to ILBI, the contact-mirror, stable technique is implemented, the exposure is along the projection of the affected vein and vascular bundles (by 4 zones), and on the area of trophic ulcer through 1–2 layers of a sterile gauze with the LO-904-20 pulsed IR laser emitting head and the ZM-50 magnet nozzle (wavelength is 904nm, power is 10–15 W, frequency is 80–150 Hz) on fields 1, 2, 3, 6 successively for one minute, and on fields 4, 5, 7, 8 successively for two minutes (see Fig. 23 in the book Moskvin S.V., Khadartsev A.A., 2017).

Obliterating Vessel Lesions of the Extremities

The indications for the requirements of low level laser therapy are: occlusions of the terminal segment of the abdominal aorta and main arteries of the lower extremities (atherosclerotic lesions of the aorto-iliac and femoral-patellar segments, Leriche syndrome) in sub- and compensated conditions of the peripheral blood circulation, obliterating endarteritis.

The LLLT technique is contact, stable with the LO-904-20 pulsed IR laser head and the ZM-50 magnet nozzle (wavelength is 904 nm, power is 10–15 W, frequency is 80–150 Hz) on fields 1–5 successively for 1.5–2 minutes (see Fig. 25 in the book Moskvin S.V., Khadartsev A.A., 2017).

The most obvious low level laser therapy effect is registered by the patients in the early stage of the disease (with ischemia of the lower extremities of I–II degrees). Three courses of therapy are implemented successively within a 3-week interval, followed by a 6-month break. Limb tissue ischemia of III and IV degrees is an indication for treatment in hospital.

ILBI technique (Table 2 or 3), there are 7–10 daily procedures per course.

Phlebitis, Thrombophlebitis, Postthrombophlebitic Trophic Disorders and Ulcers

LLLT is implemented alongside medication and immunity correction.

The technique used is contact, stable, the exposure is on-skin along the projection of the affected vein and vascular bundles (by 4 zones), and on

the area of trophic ulcer through 1–2 layers of sterile gauze with the LO-904-20 pulsed IR laser head and the ZM-50 magnet nozzle (wavelength is 904 nm, power is 10–15 W, frequency is 80–150 Hz) on fields 1, 2, 3, 6 successively for one minute, and on fields 4, 5, 7, 8 successively for two minutes (see Fig. 23 in the book Moskvin S.V., Khadartsev A.A., 2017).

2–3 courses are implemented within a two-week interval (10 daily procedures per course). If necessary, the repetition of the procedures is advisable in six months after the end of the last course.

ILBI technique (Table 2 or 3), there are 7–10 daily procedures per course.

Gastrointestinal Disorders

Acute and Chronic Cholecystitis

Low level laser therapy is implemented alongside a healthy diet and medication. The technique is stable on zones 1, 2, 4, 3 (see Fig. 28 in the book Moskvin S.V., Khadartsev A.A., 2017) with the ML-904-80 matrix pulsed IR laser head (wavelength is 904 nm, maximum power is 60–80 W, frequency is 80–150 Hz), for 1.5–2 minutes on a zone, there are 10–12 daily procedures per course.

ILBI technique (Table 2 or 3), there are 2 daily procedures in the pre-operative period and 3–5 in the postoperative period per course.

Acute Intestinal Obstruction

ILBI technique (Table 2 or 3), there are 3–5 daily procedures per course.

Chronic Nonulcerative Colitis

ILBI-635 technique (Table 1), there are 5–7 procedures per course, every other day. For ulcerative colitis V.M. Petushinova (1993) recommends increasing the exposure up to 30 minutes.

Gastritis, Duodenitis, Dyskinesia of the Digestive Organs

ILBI technique (Table 2 or 3), there are 3–5 daily procedures per course.

Gastroduodenal Ulcer

Low level laser therapy is implemented alongside a standard medication scheme. The possibility for the significant reduction of the number of dosage forms and their dosage during low level laser therapy allows

the consideration for LLLT to be an active therapeutic factor, potentiating the medication effect [Zakharov P.I., Moskvin S.V., 2007; Zakharov P.I. et al., 2005].

ILBI technique (Table 2 or 3), there are 5 to 10 procedures per course, every other day.

Hepatic Cirrhosis

In the treatment of patients with hepatic cirrhosis LLLT, according to the data of functional and morphological observations, in particular can cause changes indicating a tendency to cirrhotic process regress, at the stages of preoperative preparation and postoperative care of patients, LLLT allows the decreasing of the number and severity of postoperative complications (hepatic insufficiency, suppuration of wounds, etc.). At the stage of conservative treatment, laser exposure allows the reduction of the activity of transaminases, enhancing the functional activity of hepatocytes and stimulating intrahepatic blood flow [Artykov Sh.N., 1992].

Low level laser therapy is implemented alongside a healthy diet and traditional medication, and alcohol is strictly forbidden.

Contact stable technique is implemented on the area of the liver projection from three sides (along the parasternal, midclavicular and anterior axillary lines) with a moderate compression of tissues with the ML-904-80 matrix pulsed IR laser head (wavelength is 904nm, maximum power is 60–80 W, frequency is 80–150 Hz), for 1.5–2 minutes on a zone. With resistant ascites, the exposure is implemented through the intercostal spaces in the right half of the chest on the liver projection along middle axillary and midclavicular lines. In the postoperative period, in addition, the wound is exposed through a bandage, with splenectomy the area of the projection of the spleen is exposed. The total number of procedures per course is from 5 to 20 (refer to the book Moskvin S.V., Khadartsev A.A., 2017).

ILBI technique (Table 2 or 3), there are 10–12 daily procedures per course. For patients with hepatic cirrhosis at the stage of decompensation, with the manifestations of splenomegaly, hypersplenism, with resistant ascites, the application of only the ILBI-635 is not effective enough [Varivoda E.S., 1990].

Hepatic Insufficiency

ILBI technique (Table 2 or 3), there are 3–5 daily procedures per course.

Hepatitis Viral

As a general rule, the course of low level laser therapy consists of 10–12 daily procedures. If necessary, the number of the procedures can be increased to up to 20, and with chronic hepatitis it is possible to implement the second course within one month, and the third course – in 3 months, and then, preventive low level laser therapy courses twice a year – in the spring and autumn.

After the end of the low level laser therapy session, a 15–20 minute repose is recommended. The procedures should be implemented at the same time, as vascular reactions and changes in the metabolism underlying the mechanisms of laser illumination effect have a phase, rhythmic in character [Makashova V.V., 2003].

ILBI technique (Table 2 or 3), there are 10–12 procedures per course every day until the patient receives a clinical and biochemical effect.

Intoxication

After ILBI the rheological parameters of blood are improved, the pronounced disaggregating effect is shown, which contributes to quicker relief of erythrocyte aggregation disorders, typical for severe intoxications, and eliminates the microcirculation and hemodynamic disorders of patients with severe intoxication [Zazulevskaya L.Y. et al., 1989].

ILBI technique (Table 2 or 3), there are 3–5 daily procedures per course.

Obstructive Jaundice

ILBI technique (Table 2 or 3), there are 3–5 daily procedures per course.

Pancreatitis Acute

ILBI in the complex treatment of patients with acute pancreatitis allows health improvement of 75–80% of patients after a single session. Pain disappears, a tendency for the normalization of the activity of pancreatic enzymes comes quicker. The maximum therapeutic effect is observed in the patients with the edematous form of acute pancreatitis, as well as with the destructive forms of acute pancreatitis (fat and hemorrhagic pancreatic necrosis). Rapid disappearance of transaminase from blood serum in patients with acute pancreatitis indicates that ILBI contributes to the prevention of the destructive process in the pancreas.

ILBI technique (Table 2 or 3), there are 5–8 daily procedures per course.

Pancreatitis Chronic

ILBI technique (Table 2 or 3), there are 5–10 daily procedures per course.

Cardiology

Acute Coronary Insufficiency

After the implementation of ILBI for patients with acute coronary insufficiency, a significant increase of stress tolerance is observed, as well as the improvement of the parameters of Holter monitoring of the ECG (of total duration of myocardial ischemia in 24 hours, of the duration of painful and painless ischemia), positive changes of the parameters of lipid metabolism occur (the level of total cholesterol and triglycerides is decreased) and cholesterol in low density lipoproteins is normalized. Taking into consideration the importance of immune status disorder with progressive angina, it is necessary to draw attention to the fact that after ILBI the immune parameters are characterized with the favourable dynamics – the number of complexes influencing vessels decrease [Malinovskaya P.E. et al., 1989].

ILBI technique (Table 2 or 3), there are 5–7 daily procedures per course.

Heart Defects

ILBI technique (Table 2 or 3), there are 5–7 daily procedures per course.

Hypertension

Low level laser therapy is advised for different functional psychosomatic disorders, accompanied by the instability of the reactions of the cardiovascular system, dyskinesia, pain syndrome; borderline hypertension, hypertension of the I–II degree; inflammatory and degenerative-dystrophic processes in the organs and tissues.

Contraindications: severe course of the cardiovascular system diseases: irregular heartbeat, atherosclerotic cardiosclerosis with severe coronary circulation disorders, cerebral sclerosis with cerebral circulation disorders, aortic aneurysm, circulatory insufficiency of the II–III degree, subacute and rehabilitation period of myocardial infarction, or post-infarction angina.

Taking into consideration the chronobiological peculiarity of the disease, presence of circadian variation of blood pressure, low level laser therapy should be implemented in the morning (before 12:00 pm). Preventive courses are implemented in spring and autumn alongside medication.

With the ILBI-635 including in the complex therapy of patients with ischemic heart disease (IHD) and hypertonic disease, according to Revutskiy E.L. et al. data (1989), the obvious clinical effect is observed, the medication efficiency is increased, the hemorheological indicators are improved. Thus, blood viscosity is 30% less, aggregation of platelets is 25% less, fibrinogen is 20% less, which leads to the statistically significant reduction of the total peripheral resistance by 35%, and to diastolic BP normalization. An antiaggregatory effect was achieved by the inactivation of the products of intravascular aggregation and the improvement of the deformability of erythrocyte membranes. It is necessary to state, that the improvements of the basic parameters of hemodynamics and hemorheology are retained for 6 months after the complex treatment.

ILBI technique (Table 2 or 3), there are 3–5 procedures per course, every other day.

Infectious-Allergic Myocarditis

ILBI contributes to the improvement of the indicators of phospholipid metabolism during the first 24 hours after the exposure, and by the 15th day, a total normalization of the state of the cell membranes occur [Islamkulova L.B., 1992].

ILBI technique (Table 2 or 3), there are 5–7 daily procedures per course.

Ischemic Heart Disease, Cardiac Angina

ILBI is extremely effective in treatment of patients with cardiac angina of II–IV and IHD that is complicated by insufficient blood supply. Hemodynamics at rest is improved as well as under isometric exercise conditions, stress tolerance is increased and the objective condition of patients is improved (health, sleep, mood) [Borisova A.V., 1997]. According to T.M. Zinkovskaya's data (1995), the most optimum combination is of IR pulse LLLT local exposure and ILBI-635 (refer to the book Moskvin S.V., Khadartsev A.A., 2017).

ILBI technique (Table 2 or 3), there are 5–7 procedures per course, every day or every other day.

Myocardial Infarction (Acute Period)

With acute myocardial infarction after 1–2 procedures the pain syndrome usually disappears, the number of extrasystoles reduces and cardiac arrhythmia disappears [Toygabayev A.A. et al., 1989]. After one session of ILBI-635 in the acute period of myocardial infarction, the size of the lesion, according to ECG data, decreases by more than 33%, while in the control group there was only a 2.3% decrease, where only traditional therapy was used – 2–3% [Yerofeyev A.V. et al., 1985].

ILBI-635 technique (Table 1), there are 5–7 procedures per course, every other day.

Sinus Dysfunction Syndrome

ILBI technique (Table 2 or 3), there are 5–7 daily procedures per course.

Dentistry

The application of LLLT in dentistry is limited by the additional particular contraindications:

- all forms of leukoplakia;
- proliferative processes on the oral mucosa (papillomatosis, limited hyperkeratosis, rhomboid glossitis).

Periodontal Disease (Gingivitis, Parodontitis)

The first step of the local treatment is always the removal of dental plaque, tooth surface polishing and proper oral cavity hygiene teaching.

Laser acupuncture (wavelength is 635 nm, power 2–3 mW). Modulated mode, modulation frequency is 70 Hz, the exposure time on one point is 10–20 seconds, successively on the points: P7, GI4, E4, E5, E6, E7, E36, MC6, TR5, TR17, VG26, VG28, VC20, VC24, AP51, AP61. The course of treatment consists of 1–3 cycles, there are 5–12 daily procedures in each cycle. The interval between the cycles is 12–14 days [Britova A.A., 1992].

ILBI in the complex treatment of patients with severe generalized periodontitis can significantly reduce the treatment period (by up to 7–10 days), the remission periods increase considerably – by up to 1.5–2 years. With severe ulcerous-necrotic stomatitis the treatment period is 6–7 days less, a good analgesic effect is observed, the epithelialization is

accelerated, the body temperature is normalized and the general condition of the patients improves faster [Danilevskiy N.F. et al., 1989].

ILBI technique (Table 2 or 3), there are 5–7 daily procedures per course.

Combined EHF-low level laser therapy [Brekhov E.I. et al., 2007; Moskvin S.V., Ponomarenko G.N., 2016; Moskvin S.V., Khadartsev A.A., 2016], laser-vacuum massage [Amirkhanyan A.N., Moskvin S.V., 2005; Moskvin S.V., Ponomarenko G.N., 2016] and laser phoresis of different drugs [Moskvin S.V., Konchugova T.V., 2012; Moskvin S.V. et al., 2014] show good clinical results.

Purulent Infection Processes of Maxillofacial Area, Phlegmons

With pyo-infectious complications of facial fractures, ILBI brings the carbohydrate metabolism indicators to normal, improves the energy status of the peripheral blood erythrocytes and the structural and functional properties of their membranes. LLLT is accompanied by the immunomodulatory effect, firstly influencing the T-system of immunity and a reduction of resistance of microbial flora to antibiotics occurs [Lepilin A.V., 1995].

ILBI technique (Table 2 or 3), there are 5–7 daily procedures per course.

Endocrinology

Autoimmune Thyroiditis

Under the effect of ILBI the number of lymphocytes is increased, the number of T-helpers is reduced, the production of IgM is strengthened [Cheban A.K. et al., 1989].

ILBI technique (Table 2 or 3), there are 5–7 daily procedures per course.

Diabetes II type

ILBI in the complex treatment of patients with diabetes mellitus (DM) has a hypoglycemic, hypolipidemic, immunocorrecting effect, stimulates the residual insulin secretory function of the pancreas, increases the ability of tissues to utilize glucose. As a result, a more pronounced clinical and biochemical compensation is achieved in 82% of patients with insulin-dependent diadetes mellitus, and in 83% of patients with insulin-

independent form of diabetes. There is a reduction of up to two times for the daily need for insulin and hypoglycemic drugs in comparison with conventional therapy [Lebedkov Ye.V., 1996; Onuchin S.G., 1995].

ILBI technique (Table 2 or 3), there are 5–7 daily procedures per course.

The course of the external low level laser therapy is implemented additionally. LLLT technique is stable, contact with the ML-904-80 matrix pulsed IR laser head and the MM-50 magnet nozzle (wavelength is 904 nm, maximum power is 60–80 W, frequency is 80–150 Hz) on the zones: the calf of the lower leg – for five minutes, on the projection of the liver, pancreas and spleen – for two minutes [Kovaleva T.V., Moskvin S.V., 2003] (refer to the book Moskvin S.V., Khadartsev A.A., 2017).

Hypothyroidism

ILBI has a universal adaptogenic effect, the intake of hormonal drugs and the treatment time are reduced [Buylin V.A., Moskvin S.V., 2005].

ILBI technique (Table 2 or 3), there are 5–7 daily procedures per course.

The course of the external low level laser therapy is implemented additionally. LLLT technique is stable, contact with the ML-904-80 matrix pulsed IR laser head and the MM-50 magnet nozzle (wavelength is 904nm, maximum power is 60–80 W, frequency is 80–150 Hz), for one minute successively on each area on the following regions: the area of major neuro-vascular bundles on both sides of the neck, the anterior temporal and orbital regions, the 7th cervical vertebra (C7) and the projection of the thymus and thyroid (refer to the book Moskvin S.V., Khadartsev A.A., 2017).

Neurology

Acute Cerebrovascular Disease

Our data indicates the undeniable prospect of the use of the ML-635-40 pulsed matrix laser heads of the red spectrum (wavelength is 635 nm, maximum power is 40 W, frequency is 80–150 Hz) with different cerebrovascular pathology, first of all, in the treatment of patients with cerebral stroke [Kochetkov A.V., Moskvin S.V., 2004].

NLBI technique (Table 4, wavelength is 635nm), there are 10–12 daily procedures per course.

Cerebral Stroke

ILBI with cerebral ischemia has a positive effect on the central and regional hemodynamics (arteriodilating and venotonic effects), has a sedative and antispasmodic effect. In 86% of cases a positive result of treatment is achieved, it is proved that mortality is 1.5–2 times less compared to the control. On the 2–3rd session of ILBI, a considerable regress (by tens of percentages) of the main clinical symptoms and syndromes (headache, dizziness, noises in the head, tachycardia, tremor, arterial hypertension) occurs. ILBI is most efficient for patients with the period of the identified disease of up to 1 year [Kochetkov A.V., Moskvin S.V., 2004; Skupchenko V.V., Makhovskaya T.G., 1993; Khazov S.V. et al., 1998].

ILBI technique (Table 2 or 3), there are 8–10 daily procedures per course.

Chronic Fatigue Syndrome

ILBI technique (Table 2 or 3), there are 7–15 daily procedures per course. The parameters of the exposure are varied in accordance with a patient's age and condition.

Degenerative-Dystrophic Spine Disorders

Cramp, restless legs, radicular syndromes.

ILBI technique (Table 2 or 3), there are 5–6 daily procedures per course.

Discirculatory Encephalopathy

Our studies have proven to have maximum efficiency if the exposure is with the matrix pulsed laser heads of the red spectrum on the projection of the main arteries of the head in the treatment of patients with discirculatory encephalopathy (chronic cerebral ischemia) [Leyderman N.E. et al., 2009]. A.V. Kochetkov and co-authors (2005).

NLBI technique (Table 4), contact, stable with the ML-635-40 matrix pulsed laser head in the red spectrum (wavelength is 635 nm, maximum power is 40 W, frequency is 80–150 Hz), the exposure on a zone is for two or five minutes, there are 8–15 procedures per course. The exposure localization depends on the clinical and hemodynamic features of the disease development and course:

– the exposure is implemented on the projection of the common carotid arteries (symmetrically) with the prevalence of carotid insufficiency syndrome (anterior localization);

– the exposure is implemented on the posterior-lateral surface of the neck (posterior localization, symmetrically) with vertebral-basilar insufficiency syndrome.

OR

ILBI-635 technique (Table 1), there are 8–10 daily procedures.

NLBI and ILBI must not be implemented together in one day!

Epilepsy

Low level laser therapy provides the increase of energy and the biopotential of neurocytes and corrects their rhythmic activity. LILI has a sedative, mildly soporific, antispasmodic and anticonvulsant effect, as it directly influences the brain and autonomic centers. That is proved by our representational dynamic studies of dopplerography and EEG indicators with multifocal epileptic complex with suppression of excitation foci by laser exposure in the end. It is shown, that with the therapeutic effect of LILI on blood, epileptogenic zones and acupuncture points, the corrective changes of the activity of the neuronal formations and other structures of the brain occur [Patent 2149655 RU].

LLLT technique is combined, all methods are implemented. The initial treatment is alongside the use of medication. LILI exposure ensures the correction of the function of various brain structures as well as the metabolism, as a result, the complex therapy efficiency is increased and a further reduction of drug doses is achieved, and if there is no paroxysm according to the EEG data, drugs are completely removed.

ILBI technique (Table 2 or 3).

Contact-mirror technique, stable with the LO-904-20 pulsed IR laser head and the ZN-35 mirror nozzle (wavelength is 904 nm, power is 10–15 W, frequency is 80–150 Hz), for two minutes on each epileptogenic zone symmetrically: temporal, parietal, from the base of the skull to the top.

Contact-mirror technique, stable with the LO-904-20 pulsed IR laser head and the ZN-35 mirror nozzle (wavelength is 904 nm, power is 10–15 W, frequency is 80–150 Hz), paravertebrally for 0.5 minutes on the C_I–C_{VI} areas.

Laser acupuncture (wavelength is 635 nm, power 2–3 mW, modulated mode, frequency is 2 Hz) on the points: T24, T23, T21, T20, T19, T18, T16, VB20. Additionally, E13 – 20 seconds every day, on GI4 and E36 points every other day – 2 points (1st day) and on MC6 and RP6 points – 2 points (2nd day).

The course of treatment consists of 10–16 procedures, the first 5 procedures are implemented every day, the rest – every other day, the course is repeated in 3–3.5 months no less than 3–4 times.

Facial Nerve Neuropathy (Neuritis)

The recovery of motor functions after low level laser therapy can already be observed in most patients during the 2nd week of the illness, in 1/3 of patients by the 5–6th sessions [Skupchenko V.V., Makhovskaya T.G., 1993].

ILBI technique (Table 2 or 3), there are 8–10 daily procedures per course.

Hypothalamic Syndromes

ILBI technique (Table 2 or 3), there are 12–20 procedures per course, every day or every other day.

Ischemic and Traumatic Myelopathy

ILBI technique (Table 2 or 3), there are 10–12 daily procedures per course.

Multiple Sclerosis

Low level laser therapy is recommended for patients who have had the disease no longer than 7 years. The best results of treatment are obtained with patients having a vegetative background of the adrenergic orientation, and tension of the immune system at B-receptors level predominantly, the increase of the immunoglobulin class and circulating immune complexes [Skupchenko V.V., Makhovskaya T.G., 1993].

ILBI technique (Table 2 or 3), there are 7–15 daily procedures per course. The parameters of the exposure are varied in accordance with a patient's age and condition.

Neuroinfections (Meningitis and Meningoencephalitis)

Low level laser therapy as a nonspecific and effective corrector of the immune system is particularly relevant in this case. Numerous studies prove the reasonability of ILBI, and state that sometimes, there is no alternative in treatment of patients with these diseases [Mikhaylova E.V., 2000; Skupchenko V.V. et al., 1989].

ILBI technique (Table 2 or 3), there are 7–15 daily procedures per course. The exposure parameters are varied according to a patient's age and condition.

Polyneuropathy

Laser acupuncture (wavelength is 635 nm, power 2–3 mW, modulated mode, frequency is 2 Hz). In the first half of the day the distal points of the arm and leg the Yang-meridians: GI1, TR1, IG1, E45, VB44, V67 are exposed symmetrically from both sides. At the second stage, the exposure is on the sympathetic points (shu-points) of the small intestine meridian V27 from both sides. In the second half of the day the exposure is on the distal points of the Yin-meridians, symmetrically: P11, MC9, C9, RP1, F1, R1. Then the sympathetic points (shu-points) of the liver meridian V18 are exposed from both sides. Up to 14 points per procedure, up to 28 points per day. The exposure on one point: GI1; TR1; IG1; E45; VB44; V67; P11; MC9; C9; RP1; F1; R1 is 30 seconds, on V27 is 10 seconds, on V18 is 50 seconds; every day, two times a day with an interval of 4–6 hours, there are 10–12 procedures per course. Good results are shown, in particular, with autonomic-sensory post-radiation polyneuropathy [Zakharov Ya.Yu., 2002].

ILBI technique (Table 2 or 3), there are 15–20 daily procedures per course.

Postoperative Complications

LLLT contributes to the smooth post-traumatic and postoperative periods, in clinical terms the efficiency of treatment of neurosurgical patients (traumatic brain injury, tumors, vascular diseases) is, first of all, in the regress of the cerebral symptoms: the reduction of the degree of the impaired consciousness, of the severity of psychomotor disorders and of the headache intensity.

ILBI technique (Table 2 or 3), there are 8–10 daily procedures per course.

Radicular Syndrome after Discectomy

Radicular syndrome after discectomy of patients with lumbar osteochondrosis in 12–14% of cases becomes highly persistent. LLLT evokes vegetative-vascular, muscular-tonic responses and the antioxidant system activation [Grishanova Yu.D., 1995].

ILBI technique (Table 2 or 3), there are 8–10 daily procedures per course.

Traumatic Brain Injury

The restriction for ILBI is a massive subarachnoid hemorrhage. It should be emphasized, that ILBI is allowed in the complex intensive

therapy of the acute period of severe traumatic brain injury beginning with the 2nd–3rd day of the postoperative period taking into consideration the careful intraoperative hemostasis.

ILBI technique (Table 2 or 3), there are 7–12 daily procedures per course. LLLT favorably influences the antioxidant system, improves blood rheology, and has immunomodulatory and membrane stabilizing effects [Klimova L.V., 1998].

Vibration Disease

ILBI technique (Table 2 or 3), there are 8–10 daily procedures per course.

Otorhinolaryngology

Eustachitis, Otitis External and Media. Cochleoneuritis. Meniere's Disease

A positive effect of ILBI with Meniere's disease (subjective noise reduction, increase of the value of the differential threshold of the perception of sound power) is achieved in 79.2% of patients [Reshetnikova N.L., Stegunina L.I., 1998].

ILBI technique (Table 2 or 3), there are 5–7 daily procedures per course.

Sensorineural Hearing Loss

ILBI technique (Table 2 or 3), there are 5–7 daily procedures per course.

Ophthalmology

Diabetic Retinopathy

Evgrafov V.Yu. (2006) proved that the application of ILBI for patients with proliferative diabetic retinopathy makes it possible to improve all the indicators considerably; what is more, the effect lasts for 1–4 months after the end of the treatment course.

ILBI technique (Table 2 or 3), there are 7–10 daily procedures per course.

Retinal Vein Thrombosis

LLLT leads to the reduction of the coagulation activity of the lacrimal fluid, and leads to the increase of the fibrinolytic activity, the phagocytosis activity is increased, the level of immunoglobulins, circulating immune complexes, molecules of the average mass, and POL (lipid peroxidation) products is decreased. That allows an 11% reduction of the complication development, from a 20% to a 5% reduction of the development of recurrent thrombosis and obtaining higher functional outcomes in comparison with traditional therapy [Makhmutova T.I., 1995].

ILBI technique (Table 2 or 3), there are 5–7 daily procedures per course.

Vitreous Hemorrhage (Hemophthalmos)

The inclusion of ILBI in the scheme of treatment contributes to blood resorption strengthening, followed by the visual functional improvement. LLLT blocks the toxic effect of the products of hemolysis on the retina, decreases the fibro-proliferative effects in the long term, that reduces the risk of complications with hemophthalmos of various etiology [Deyneka E.D., 1996].

ILBI technique (Table 2 or 3), there are 7–10 daily procedures per course.

Psychiatry

Abstinence Syndrome of Patients with Alcoholism

Strengthening of antioxidant protection and of the oxygen-transport blood function, normalization of the metabolism, detoxifying and sedative effects occur alongside ILBI. A considerable decrease or complete elimination of the use of pharmacological agents is observed, general condition is normalized and basic homeostatic indicators are stabilized faster [Sosin I.K., Chuev Yu.F., 1997].

ILBI technique (Table 2 or 3), there are 2–3 daily procedures per course.

Abstinence Syndrome of Patients with Drug Addictions

Strengthening the antioxidant protection and the oxygen-transport blood function, normalization of metabolism, detoxifyinh and sedative

effects occur alongside ILBI, the general condition is normalized and basic homeostatic indicators are stabilized faster [Sosin I.K., Chuev Yu.F., 1997].

The 1st variant of LLLT technique. During the first 5 days NLBI is implemented (Table 4, on the projection of the common carotid artery for 1.5–2 minutes on a zone, asymmetrically). The exposure on the zones of the projections of the liver, pancreas, large intestine and superior cervical sympathetic ganglion is implemented additionally, for two minutes on each zone. The technique is contact, stable with the ML-904-80 matrix pulsed IR laser head and the MM-50 magnet nozzle (wavelength is 904 nm, maximum power is 60–80 W, frequency is 80–150 Hz) [Nasedkin A.A., Moskvin S.V., 2004].

The 2nd variant of LLLT technique. ILBI-635 (Table 1, power is 6–8 mW, exposure is 30–40 minutes), during the first 2–3 days with the interval of 6–8 hours twice a day. Additionally, with severe abstinent disorders NLBI is implemented (Table 4, on the projection of the common carotid artery for 1.5–2 minutes on a zone). Beginning with the 4–5th day, laser acupuncture, detoxification, restorative vegetotropic and sedative treatment are included into the complex.

The 1st and 2nd variants can be combined, but must not be used simultaneously!

Endogenous Psychoses

In the complex treatment of drug-resistant affective disorders of patients with endogenous psychoses, ILBI is recommended for the treatment of mostly melancholy-depressive and anxiodepressive syndromes. An ILBI course is advisable if there are no positive dynamics of mental disorders within 3 weeks from the moment of prescription of traditional pharmacotherapy (if there are clinical signs of relative resistance and the formation of a negative drug pathomorphism). To control the efficiency of the therapy, an experimental psychological (differentiated self-concept test) examination and psychophysiological (study of the attention switching, visual-active thinking study, study of the subjective perception of time slots) examination, an assessment of the condition and dynamics of the nonspecific resistance of the organism (analysis of the types of adaptive reactions), as well as of the lipid peroxidation indicators are recommended together with the clinical examination. Positive clinical dynamics are registered in 57% of patients, as well as in 64% of cases the

normalization of psychological and psychophysiological indicators was observed. The efficiency of ILBI is not the same with different options of depressive syndrome. The improvement of the mental condition was observed in 70.6% of patients with melancholy-depressive syndrome, in 53.8% with anxiodepressive syndrome, and in 39% with apathy-depressive syndrome. The improvement of the mental condition of patients during low level laser therapy is accompanied by the normalization of the nonspecific resistance system indicators. In the case of positive clinical dynamics, the reduction of the frequency of adaptive reactions of a pathological type went from 52.6% to 10.6%, and a decrease of the level of malondialdehyde in plasma is observed [Perstnev S.V., 1995].

ILBI technique (Table 2 or 3), there are 5–7 daily procedures per course.

Schizophrenia

ILBI influences the central and regional hemodynamics, and has sedative, anxiolytic and antispasmodic effects, the amount of drugs taken and the treatment period are reduced [Kartelishev A.V., Vernekina N.S., 2000].

ILBI technique (Table 2 or 3), there are 8–10 procedures per course, every day or every other day. Additionally, exposure on the zones is implemented, the technique is contact-mirror, stable with the LO-904-20 pulsed IR laser head and the ZN-35 mirror nozzle (wavelength is 904 nm, power is 10–15 W, frequency is 80 and 1500 Hz alternately), the exposure is 15–30 seconds alternately on each zone on the following regions: large neuro-vascular bundles on both sides of the neck, the anterior temporal, orbital and occipital areas, the 7th cervical vertebra (C_7). The treatment is implemented alongside psycho-pharmacotherapy (refer to the book Moskvin S.V., Khadartsev A.A., 2017).

Pulmonology

Acute Bronchitis and Chronic Bronchitis in the Exacerbation Phase

The treatment is implemented alongside antibacterial therapy and other medications (antibiotics, bronchodilators, mucolytics, vitamins, etc.).

ILBI technique (Table 2 or 3), there are 7–10 daily procedures per course.

Acute Pneumonia. Exacerbation of Chronic Pneumonia

Low level laser therapy alongside medication is prescribed 1–2 days after getting positive results from etiotropic treatment (body temperature stabilization, wheezing decrease, decrease of toxins).

ILBI technique (Table 2 or 3), there are 7–10 daily procedures per course.

Preventive courses of low level laser therapy with chronic pneumonia are implemented 1–2 times a year, in the spring and autumn periods.

Bacterial Destruction of the Lungs

According to A.O. Ledin's data (1994), the inclusion of ILBI in the complex treatment during the postoperative period allows a 12.5 time decrease of complications, 1.4 times reduction of treatment duration in a total absence of fatal cases.

Particular contraindications: polygonal abscess form with hard-to-reach areas, more than 150 ml of purulent exudation per day.

ILBI technique (Table 2 or 3), there are 5–7 daily procedures per course.

Bronchial Asthma. Allergic Processes in the Lungs

Low level laser therapy is implemented alongside medication with a gradual dose reduction or cancelation in accordance with the improvement of the patient's condition, as well as physiotherapy and adequate types of breathing exercises.

ILBI technique (Table 2 or 3), there are 5–7 daily procedures per course.

The exposure on fields 2, 3, 4 is implemented additionally to ILBI successively for 1.5–2 minutes (see Fig. 49 in the book Moskvin S.V., Khadartsev A.A., 2017). The technique is contact, stable with the ML-904-80 matrix pulsed IR laser head and the MM-50 magnet nozzle (wavelength is 904 nm, maximum power is 60–80 W, frequency is 80–150 Hz)

Bronchiectatic Disease

According to I.A. Zarembo (1989), N.M. Shelygina and co-authors (1989), the improving of the condition of patients with bronchiectatic

disease is registered after the first 2–3 ILBI procedures: a reduction of coughing, breath decrease, amount of sputum, chest pain intensity and sleep improvements are observed. Positive dynamics of the disease course is strongly pronounced, which leads to a 3–4 day reduction of the hospital stay.

ILBI technique (Table 2 or 3), there are 5–7 daily procedures per course.

Chronic Nonspecific Lung Diseases

ILBI in the complex therapy of patients with an infectious-dependent form of bronchial asthma and chronic obstructive bronchitis contributes to the faster relief of the main symptoms of the disease and to the clinical remission, which is achieved in a shorter time in comparison with the traditional method without low level laser therapy [Zarembo I.A., 1989].

ILBI technique (Table 2 or 3), there are 7–10 daily procedures per course.

Chronic Obstructive Bronchitis

ILBI in the complex therapy of patients with chronic bronchitis leads to faster remission, which is accompanied by the improvement of the indicators of respiratory functions and by the decrease in the intensity of lipid peroxidation [Babina E.M., 1995; Smirnova M.S., 1996].

The technique is contact, stable with the ML-904-80 matrix pulsed IR laser head and the MM-50 magnet nozzle (wavelength is 904 nm, maximum power is 60–80 W, frequency is 80–150 Hz), successively for 1.5–2 minutes on fields 2, 3, 4 (see Fig. 49 in the book Moskvin S.V., Khadartsev A.A., 2017).

ILBI technique (Table 2 or 3), there are 5–7 daily procedures per course.

Lung Abscess

Low level laser therapy is implemented alongside antibacterial, detoxifying and anti-inflammatory therapy. If necessary, drainage of intrapulmonary abscesses and lung empyema is provided [Temirbulatov V.I., 1994].

ILBI technique (Table 2 or 3), there are 5–7 daily procedures per course.

Surgery

Low level laser therapy contributes to the faster healing of damaged tissues, it considerably reduces (10–12 times less) the possibility of postoperative complications, the treatment time is reduced, a patient's ability to work is restored faster.

The main tasks of low level laser therapy in the postoperative period are to improve a patient's general condition, to prevent stagnation caused by a patient staying in bed, to stimulate the repair processes in injured tissues, to eliminate or reduce pain syndromes, to normalize trophisms and prevent contracture formation.

Anesthesiology

The inclusion of ILBI in the complex of anaesthesia measures aimed at a patient's protection from surgical stress increases their level, which is confirmed by lower sugar content in a patient's blood at the stages of surgical intervention under using less anesthetics and narcotic analgesics. ILBI also contributes to faster restoration of stress affected tissue metabolism [Avrutsky M.Ya. et al., 1997].

ILBI-635 technique (Table 1). The procedure time is 30 minutes for the three procedures: the first – 10 minutes before the anesthesia input, the second – during the most traumatic surgery phase, the third – 30 minutes before the supposed end of surgery [Avrutsky M.Ya. et al., 1997].

Burns and Frostbites

Low level laser therapy *is recommended* with exudative inflammation syndrome of singes; for the prevention of the deepening and the stimulation of reparative processes in wounds with subdermal burns; for the improvement of blood circulation and lymphokinesis in the paranecrotic zone and for the stimulation of the full granulation cover formation during the preoperative period with deep burns, and during the postoperative period – for the stimulation of the regenerative processes; for the prevention and treatment of pneumonia and the relief of secondary immune deficiency.

Low level laser therapy is *contraindicated:* for the patients having extensive deep burns and unfavorable or doubtful prognosis during the period of burn shock; for the patients with acute respiratory failure, acute renal hepatic failure; acute cerebral circulation disorder; uncompensated diabetes, acute alcohol intoxication delirium and epilepsy.

The illumination is implemented in the early stages of a burn trauma, on the open wound surface, distantly (at the distance of 5–6 mm from the wound surface) or through bandages, with the LO-904-20 pulsed IR laser head (wavelength is 904 nm, power is 10–15 W, frequency is 80–150Hz), the exposure on one point is eight seconds – until necrosis rejection, four seconds – after its removal. The exposure is implemented on 3–4 points of 1% of the area, the procedure time is up to six minutes (up to 35 points can be exposed during one procedure). If necrosis occurs, the treatment course is five procedures, during the preoperative period (on the open wound) – five procedures, during the postoperative period (during bandaging or through the bandage) – in accordance with the indications, but not more than five procedures [Gerasimova L.I., 2000].

ILBI technique (Table 2 or 3), there are 5–7 daily procedures per course.

Erosions, Ulcerations of the Mucous Membrane

Cytological examinations must exclude malignancy.

LLLT technique is stable, distant with the ML-904-80 matrix pulsed IR laser head and the MM-50 magnet nozzle (wavelength is 904nm, maximum power is 60–80W, frequency is 80–150Hz), on the zones of general exposure (zones 1, 2), for two minutes on one zone. The illumination of the lesion is implemented with the same parameters for 2–5 minutes. The course consists of 5–7 daily procedures (see Fig. 57 in the book Moskvin S.V., Khadartsev A.A., 2017).

ILBI technique (Table 2 or 3), there are 5–7 daily procedures per course.

Lymphadenitis

Before the low level laser therapy prescription, it is necessary to define the nature of the process. In the stage of increasing and thickening of the lymph nodes (submandibular, cervical, axillary, inguinal, etc.) the zones of pain and thickening are exposed directly.

LLLT technique is stable, contact with the ML-904-80 matrix pulsed IR laser head and the MM-50 magnet nozzle (wavelength is 904nm, maximum power is 60–80W, frequency is 80–150Hz), into the lymph nodes, the exposure is 2–5 minutes on one zone (refer to the book Moskvin S.V., Khadartsev A.A., 2017).

ILBI technique (Table 2 or 3), there are 10–12 daily procedures per course.

Osteomyelitis

ILBI in the treatment of patients with fistulous forms of chronic osteomyelitis allows a 1.5 time reduction of the preoperative period while the number of recurrences is two times less, contributes to the faster reduction of endogenous intoxication and to the earlier normalization of the immunological reactivity of the organism, which is reflected in the rapid improvement of patients' health, the normalization of the biochemical indicators and blood rheology improving [Kalimbetov U.Zh., 1992].

ILBI technique (Table 2 or 3), there are 10–12 daily procedures per course.

Peritonitis

The most significant therapeutic effect in patients with localized and generalized forms of peritonitis is achieved by the use of the combined method of treatment: antibiotic lavage of the abdominal cavity, and low level laser therapy – in the postoperative period.

LLLT technique is stable, contact with the ML-904-80 matrix pulsed IR laser head and the MM-50 magnet nozzle (wavelength is 904nm, maximum power is 60–80W, frequency is 80–150Hz), for 1.5–2 minutes on a zone, through the abdominal wall (zones 3–6), on the projection of the femoral vessels (zones 7, 8), on the projection of the thymus (zone 2) and the left subclavian vascular bundle (zone 1). There are 3–7 daily procedures per course (see Fig. 57 in the book Moskvin S.V., Khadartsev A.A., 2017).

ILBI technique (Table 2 or 3), there are 5–7 daily procedures per course.

Postoperative Complications Ulcers, Postoperative Suppuration, Pressure Ulcers

Laser exposure is implemented after the toilet of the affected area, distant at the distance of 0.5–1cm (stable or labile) with the ML-904-80 matrix pulsed IR laser head and the MM-50 magnet nozzle (wavelength is 904nm, maximum power is 60–80W, frequency is 80–150Hz), for 1.5–2 minutes on a zone. There are 3–5 daily procedures per course (refer to the book Moskvin S.V., Khadartsev A.A., 2017).

ILBI technique (Table 2 or 3), there are 5–7 daily procedures per course.

Postoperative Pareses, Intestinal Obstruction

Low level laser therapy can be implemented on the second day after the surgery. Patients with functional disorders of the motor activity of the intestine (flatulence, atony, constipation), calcium deficiency, as well as elderly and senium patients should undergo low level laser therapy procedures 2–3 days before the surgery for prophylactic purposes [Buylin V.A., 1990].

The technique is contact-mirror, labile with the LO-904-20 pulsed IR laser head and the ZN-35 mirror nozzle (wavelength is 904nm, power is 10–15W, frequency is 80–150Hz), on the abdominal wall by spiral motions, 1–2 passages along line 1) for 4–6 minutes along the colon from the zone of the projection of the cecum to the sigmoid colon (Fig. 58). The procedure must be repeated in 4 hours. The course of treatment is 2–3 days (4–6 procedures). The exposure can be implemented through a bandage; the laser head pressure (the mirror nozzle pressure) on the skin surface must not cause any pain.

Laser acupuncture (wavelength 635nm, power 2–3mW, modulated mode, frequency is 2.4Hz). The exposure on one point is 25–30 seconds, successively on the points (symmetrically): GI4, E25, E36, RP1, RP4, RP6, MC6, the exposure is finished with asymmetrical point VC12 ("basic recipe", Fig. 11). The procedure is implemented in the first half of the day at the same time. The motor activity of the intestine is usually restored after two procedures.

This technique is also efficient with motor intestinal disorders of therapeutic, cardiac patients, etc.

ILBI technique (Table 2 or 3), there are 5–7 daily procedures per course.

Purulo-Necrotic Complications of Diabetic Patients

All forms of diabetes with purulent necrotic infections can be the indications for ILBI. The combined application of ILBI with hemosorbtion with the use of activated carbon has a pronounced detoxifying effect. LLLT contributes to a smoother postoperative course, earlier (10–12 days less) wound healing, a 1.8–2 time reduction of the "stay in bed" period [Lebedkov Ye.V., 1996].

ILBI technique (Table 2 or 3), there are 10–12 daily procedures per course.

Pyoinflammatory Diseases

ILBI in the treatment of pyoinflammatory diseases contributes to the antioxidant defense system normalization, has immunomodulatory and anti-inflammatory effect, intoxication and bacterial contamination of wounds are reduced, and the healing processes are accelerated [Erzhanov O.N., 1993].

ILBI technique (Table 2 or 3), there are 7–10 daily procedures per course.

Syndrome of Disseminated Intravascular Coagulation (DIC)

When significant blood loss during surgery occurs, ILBI prevents DIC-syndrome development, normalizes blood rheology, the main hemostasis indicators are aligned by the 5th day after the surgery, the possibility of the bleeding resumption from the stitched wounds is eliminated [Koshelev V.N. et al., 1995].

ILBI-635 technique (Table 1), there are 5–7 daily procedures per course.

Wounds (Home, Sports, Gunshot)

The wound toilet or debridement are necessary.

With *slow healing wounds* LLLT is implemented by courses of 10 daily procedures with 2-week breaks (2–3 courses). The exposure on the wound area is distant, stable on the fields or labile (scanning), trying to overlap the wound maximally. It is efficient to combine the exposure with the ML-904-80 matrix pulsed IR laser head (wavelength is 904nm, maximum power is 60–80W, frequency is 80–150Hz) for 1.5 minutes, with the interval of 1.5 minutes, with the ML-635-40 matrix pulsed red laser head (wavelength is 635nm, maximum power is 40W, frequency is 80–150Hz), also for 1.5 minutes.

ILBI technique (Table 2 or 3), there are 5–7 daily procedures per course.

Festering wounds, phlegmons, abscesses, mastitis, felons. LLLT is implemented after the surgical opening of the purulent focus in the complex with medication, enzymatic bandages and other bandages. After the wound toilet, the exposure is implemented through 2–3 layers of gauze in a stable manner on 2–4 fields (depending upon the wound area). It is possible to implement the exposure through a bandage. LLLT technique is stable, contact with the ML-904-80 matrix pulsed IR laser emitting head

and the MM-50 magnet nozzle (wavelength is 904nm, maximum power is 60–80W, frequency is 80–150Hz), the exposure time is 2–5 minutes (refer to the book Moskvin S.V., Khadartsev A.A., 2017).

ILBI technique (Table 2 or 3), there are 7–10 daily procedures per course.

Urology

Acute and Chronic Cystitis

ILBI technique (Table 2 or 3), there are 7–10 daily procedures per course [Moskvin S.V. et al., 2004; Ivanchenko L.P. et al., 2009].

Acute Pyelonephritis

LLLT (external into the projection of the kidneys) improves microcirculation in the parenchyma of a damaged kidney and is recommended for all the variants of the disease; ILBI is recommended with a pronounced suppression of cellular and humoral immunity; a combined technique is recommended with pyo-septic kidney diseases with severe intoxication.

LLLT technique is contact, with the ML-904-80 matrix pulsed IR laser head and the MM-50 magnet nozzle (wavelength is 904nm, maximum power is 60–80W, frequency is 1500–3000Hz), successively on the projections of the kidneys for five minutes on a zone. The number of procedures should be no more than 10, every day or every other day (refer to the book Moskvin S.V., Khadartsev A.A., 2017).

ILBI technique (Table 2 or 3), there are 7–10 daily procedures per course [Moskvin S.V. et al., 2004; Ivanchenko L.P. et al., 2009].

Amyloidosis

ILBI technique (Table 2 or 3), there are 10–12 daily procedures per course.

Repeated courses of low level laser therapy are implemented in 6 and 12 months. Then repeated low level laser therapy courses are implemented every 12 months over a period no less than 5 years [Lutoshkin M.B., 2003].

Chronic Kidney Disease

ILBI technique (Table 2 or 3), there are 10–12 daily procedures per course.

Repeated courses of low level laser therapy are implemented in six and 12 months. Then repeated courses are implemented every 6–12 months during a period of 5–10 years [Lutoshkin M.B., 2003].

Chronic Pyelonephritis

ILBI technique (Table 2 or 3), there are 10–12 daily procedures per course.

During the next 5–7 procedures the projections of the kidneys are exposed symmetrically, the technique is contact, stable with the ML-904-80 matrix pulsed IR laser head and the MM-50 magnet nozzle (wavelength is 904nm, maximum power is 60–80W, frequency is 80–150Hz), for 2–5 minutes on each side [Lutoshkin M.B., 2003].

Diabetic Nephropathy

ILBI technique (Table 2 or 3), the first 5 procedures.

During the next 5–7 procedures the projections of the kidneys are exposed symmetrically, the technique is contact, stable with the ML-904-80 matrix pulsed IR laser head and the MM-50 magnet nozzle (wavelength is 904nm, maximum power is 60–80W, frequency is 80–150Hz), for 2–5 minutes on each side.

Repeated courses are implemented in 3 and 6 months. Then a low level laser therapy course must be implemented once a year over the course of 5–10 years.

All patients receive complex therapy according to the underlying disease – diabetes – taking into account, the type, option and severity of the underlying disease.

The LLLT sessions improve the patients' quality of life, reducing and blunting the clinical manifestations of uremic intoxication and diabetes itself – polyneuropathy, angiopathy, itching, dyspepsia. The available data clearly indicates the overall positive effect of LILI on the renal function of diabetic patients with diabetic nephropathy development [Lutoshkin M.B., 2003].

Glomerulonephritis

ILBI technique (Table 2 or 3), there are 10–12 daily procedures per course.

The course of treatment consists of 10–12 procedures. Repeated courses are implemented in 3–6–9 months to secure the result, or prophylactically [Lutoshkin M.B., 2003].

Low Level Laser Therapy during Hemodialysis and after Kidney Transplantation

Low level laser therapy of patients with terminal renal failure after the program of hemodialysis treatment leads to a 55–60% reduction of the development of complications, to the decrease of the total peripheral resistance and heart function improvement, to a significant decrease of triglycerides, prebetalipoproteids, cholesterol, to the normalization of lipid peroxidation, to the improvement of the indicators of the activity of redox processes, to the microcirculation improving connected with the capillary expansion and to the improvement of the rheological blood parameters according to the coagulogram data. A smoother course of uremic pericarditis is observed, mortality is reduced, the disease duration with pyo-septic complications is reduced, their resolution is faster than in the control group, due to the endogenous intoxication reduction (urea level, creatinine level, middle molecules) and with the elimination of the state of immunological paralysis as a result of the expressed immunosuppressive therapy in connection with the crises of rejection of the transplanted kidney [Zakharov V.V. et al., 1995; Lebedkov Ye.V., 1996; Lutoshkin M.B., 2003; Sernyak P.S. et al., 1995].

ILBI technique (Table 2 or 3), there are 10–12 daily procedures per course.

Male infertility

LLLT technique is contact, stable with the ML-904-80 matrix pulsed IR laser head and the MM-50 magnet nozzle (wavelength is 904nm, maximum power is 60–80W, frequency is 80–150Hz), successively on the sacrum and perineum regions for two minutes on each zone. There are up to 10 procedures per course (refer to the book Moskvin S.V., Khadartsev A.A., 2017).

ILBI technique (Table 2 or 3), there are 7–10 daily procedures per course.

Prostatitis

Due to the multicomponent and multilevel effect of LILI, to the metabolism and blood circulation normalization, the complex treatment of urological diseases with the help of LILI is accompanied by the increase of the efficiency of all therapeutic measures. A considerable improvement of the lymph and blood circulation in the area of laser exposure causes

a more efficient delivery of antibiotics into the prostate, which allows doctors to reduce the number and dosage of drugs.

Low level laser therapy is an additional means in the sub-acute and chronic periods of the disease contributing to the lesion sanitation, and mobilizing the sanogenetic mechanisms of the body. The achievement of high therapeutic results, treatment time reduction, elimination of a patient's overloading on medication can be ensured by the simple organizational and treatment condition compliance. These conditions are: a rational diet, an individual rhythm of work and rest, physiotherapy, a sexual hygiene rule compliance, normalization of the function of the organs taking part in hormonopoiesis, sedatives. If neuropsychiatric symptoms occur, then the elimination of potential sources of infection. The treatment of patients with latent trichomoniasis, tuberculosis and other infectious diseases of the prostate is implemented alongside specific medication and immunological control.

ILBI technique (Table 2 or 3), there are 10–12 daily procedures per course.

Vibromagnetic laser massage technique (refer to the book Moskvin S.V., Khadartsev A.A., 2017).

It is known, that a prostate massage improves circulation and reduces phlebostasis, contributes not only to the rush of arterial blood in the prostate tissue, thus improving its trophism, but also to the elimination of stagnant secretion and to the acini release, causing the occluded ducts drainage and antibiotic access facilitation. It is successfully applied to create the necessary outflow of pathological products contained in the secretion of the dilated acini with the congestive form of chronic prostatitis.

Vibromagnetic laser prostate massage tactics depends upon the nature of the disease, its duration, the condition of the abdominal and pelvic floor muscles, the cardiovascular system function, a patient's age and his working and living conditions.

The vibromagnetic laser prostate massage can be implemented not only to treat, but to also prevent the disease from occurring, as well as to increase male potency and to cure male infertility.

Contraindications to this procedure are acute prostatitis, exacerbation of common infections and purulent diseases, body temperature increase and exacerbation of chronic prostatitis and gleet, tuberculosis of genitals, cancer and stones of the prostate, anal fissures, proctitis, paraproctitis, aggravation of hemorrhoid and acute infections.

The vibromagnetic laser massage should be included into the general low level laser therapy scheme described above. The procedures are implemented every day with a partially filled bladder, the *bladder must be discharged immediately after each procedure*. A patient is in a urogynecological chair in the supine position. A condom is put on a nozzle; the exposure is implemented through the rectal ampoule mucous.

Procedures 1–5 are implemented with LILI only, without vibration, exposure is five minutes, laser illumination modulation frequency is 10Hz.

Procedures 6–10 are implemented with the switched on vibration and LILI, exposure is five minutes, modulation frequency is 10Hz, vibration frequency is 3Hz, the amplitude is 20%. Vibromagnetic laser massage is implemented only if a patient does not have any feelings of pain. Otherwise, the doctor varies the vibration amplitude.

Procedures 10–15 are implemented with the use of a vibromassage only, without laser illumination, exposure is five minutes, vibration frequency is 8–10Hz. The maximum vibration amplitude is up to 60%, under the control of a patient's subjective assessment.

Our numerous studies have shown the high efficiency of this technique in the complex treatment of patients with chronic bacterial prostatitis, which increases the effectiveness of treatment due to the combined effect of antibacterial drugs, bacteriostatic and immunomodulatory effects of the physical factors applied, due to the recovery and normalization of microcirculation in the prostate area and the improvement of drainage function of the prostate ducts. The efficiency of treatment can be up to 92%. [Zakharova M.P., 2014; Ivanchenko L.P. et al., 2009; Moskvin S.V. et al., 2004; Mufaged M.L. et al., 2007; Sosnovskiy I.B., 2012].

Urogenital Infections, Urethritis

The treatment is implemented alongside standard antimicrobial therapy.

ILBI technique (Table 2 or 3), there are 15 daily procedures per course.

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Research Center “Matrix”

PRODUCT CATALOGUE

February 2018

New generation of laser physiotherapy devices **“LASMIK”** and **“LASMIK-ILBI”**

Upgraded laser therapy devices **“Matrix”, “Matrix-ILBI”, “Matrix-Urolog”, “Matrix-MINI”, “Matrix-BIO”,** etc.

High-performance physiotherapy complexes **“Matrix-Urolog”** and **“LASMIK-Cosmetolog”**

Lipolytic program and complex **“LASMIK-Slim”**

Vacuum massage device **“Matrix-VM”**

Heads, KIVL disposable sterile light guides for ILBI, additional devices, physiotherapy stand, books, training, etc.

for medicine...

obstetrics and gynecology
andrology and urology
dermatology
cardiology
neurology
ophthalmology
pediatrics
dentistry
musculoskeletal system diseases
physiotherapy
etc.

for cosmetology...

general rejuvenation
face-lifting
body shape correction
hair cosmetology
laser peeling
laser phoresis of hyaluronic acid and other biologically active substances (anti age program, laser biorevitalization, lipolytic program, anti-cellulite program)
dermatological problems (vitiligo, acne, herpes, furunculosis, etc.)
etc.

BRAND NEW!

“LASMIK” and “LASMIK-ILBI”

New generation of the devices – new potential for treatment and prevention of a wide range of diseases

- The frequency range has been extended up to 10 000 Hz.
- For the first time pulsed lasers can securely operate at the frequency of 10 000 Hz.
- Convenient, extremely reliable LASMIK® connector with the colour differentiation of the wavelength of lasers.
- Five-year manufacturer’s warranty, including the warranty for all pulsed laser emitting heads.

Best design and ergonomics

It is simple and easy to operate the LASMIK devices!

Simple, user-friendly control panel.

It is possible to learn to operate the apparatus in 5 minutes, and it is not necessary to refer to the instruction manual. Everything is extremely simple and clear!

In 95% of techniques the exposure is 2 or 5 minutes, which is taken into account in "LASMIK" devices, – the fixed timer values are set exactly like this. This saves time and makes the work of the medical staff much easier. But it is also possible to set any time from 1 second to 90 minutes.

The frequency of 10 000 Hz allows the implementation of new high-performance laser therapy techniques (dermatology, neurology, anesthesia, etc.). The fixed values are set according to those which are most frequently used in the techniques (10, 80, 3000 and 10 000 Hz), but it is possible to choose different ones from 0,5 to 10 000 Hz.

The built-in photometer allows the user to monitor pulse and average power over the entire spectral range (from 365 to 960 nm).

The most reliable and simple connection with the emitting head.

The power switch is on the rear panel of the device which completely eliminates its accidental shutdown during the procedure and increases the reliability of the operation.

5-year warranty!

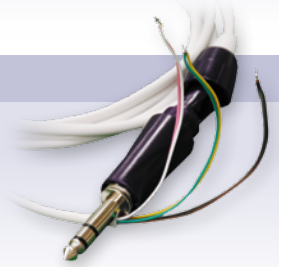
1. Only heavy-duty membrane keyboards are used, which ensures **1 000 000** pressings of any button of the keyboard, that means **more than 20 years** of the continuous work of the device!

There can fast occur fading, cracking and button breaking in standard devices. We use sealed electrically conductive contact pads, which are located at some distance; when pressing the membrane with a finger, it flexes till the touch of the contact surfaces and thus the switch-over happens.

2. The extremely reliable connectors TRS 6.35 mm stereo, made in accordance with the unique 3-wire LASMIK® technology are impossible to break!

The time of warranty is no less than 20 years, the process of changing the laser emitting head is simple and easy!

3. Each of the three control lines is duplicated with a double wire which completely eliminates any accidental breakage and greatly increases the reliability of the device as a whole.



4. Foreign laser diodes from the world's leading manufacturers have a warranty period of the continuous operation up to 150 thousand hours! It is unreasonable to save on reliability.

5. The remote power supply unit certified in accordance with the European standards for medical equipment (EN60601-1) eliminates the high voltage in the device itself and increases its reliability.

Control panels of “Matrix” and “LASMIK” devices have slight functional differences.

Parameters	“Matrix” and “Matrix-Urolog”	“LASMIK” and “LASMIK-ILBI”
Laser illumination pulse repetition rate, Hz:		
• Fixed	10, 80, 600, 3000	10, 80, 3000, 10 000
• Optional	0,5–3000	0,5–10 000
Time of the illumination exposure of the device, min.:		
• Fixed	1; 10 and “H”	2; 5 and “H”
• Optional	0,1–90	0,1–90
• External modulation mode	Availability	Availability

The main advantages of “LASMIK” and “LASMIK-ILBI” devices

- The frequency range has been extended up to 10 000 Hz.
- The availability of the option with the vacuum channel for laser-vacuum technique (“LASMIK”).
- The power control and the possibility to set up the frequency from 0,5 up to 10 000 Hz in each of the channels.
- For the first time pulsed lasers can operate at the frequency of 10 000 Hz.
- The wavelength and power limit indication on all laser heads.
- The measurement and digital indication of the pulse and average illumination power within the range of wavelengths from 365 to 960 nm.
- The continuous, pulse, modulated, multi-frequency and bioresonance operation mode of laser emitting heads is ensured.
- The fixed timer values of 2 and 5 min allow quick and unmistakable choosing of the required mode, which is used in most laser therapy techniques.
- The maximum choice of laser emitting heads for all laser therapy techniques.
- Convenient and extremely reliable LASMIK® connectors for the attachment of the heads, which are of different colours according to the wavelength of the laser used.
- The coloured fastening straps of laser emitting heads for ILBI together with the colour differentiation of the connectors allow avoiding mistakes while choosing the wavelength required for the procedure.
- The devices for ILBI are unified with general therapy devices, all laser therapy techniques can be implemented on all devices.
- The devices are maximally unified to be combined with other physiotherapy devices and to implement conjoined and combined techniques.
- The minimum weight allows moving the devices to any department of the medical center.
- The protection against any unauthorized change of the operation mode during the procedure.
- Modern design and increased reliability.
- 5-year device warranty and for the first time the warranty for IR-laser emitting heads.

Specifications of “LASMIK” and “LASMIK-ILBI” devices

The number of concurrent channels for emitting heads	1, 2 or 4
Control and indication of the illumination power and wavelength of the laser sources	There is
The illumination wavelength for laser emitting heads, nm	365–1300 (is defined by the type of the exchangeable remote emitter)
The illumination wavelength for EHF range, mm	4,9; 5,6; 7,1 (is defined by the type of the exchangeable remote emitter)
The method of setting of the timer value and pulse repetition frequency	fixed or optional
The timer (automatic mode)	
fixed values, min	2; 5 and “N” (not limited)
optional choice, min	0,1–90
The frequency of the modulation and repetition of the pulses, Hz	
fixed values	10, 80, 3000, 10 000
optional choice	0,5–10 000
The illumination power adjustment	from 0 to maximum value
Weight, g	
LASMIK-01 (2 laser channels)	800
LASMIK-02 (4 laser channels)	4200
LASMIK-03 (1 laser and vacuum channel)	950
Dimensions, mm:	
LASMIK-01 (2 laser channels)	280×210×105
LASMIK-02 (4 laser channels)	345×260×150
LASMIK-03 (1 laser and vacuum channel)	280×210×105
Electrical safety class	II, B type (grounding is not required)
Laser safety class	1M
Power:	
Voltage, V	90–250
Frequency, Hz	47–65
Maximum power consumption, VA	
LASMIK-01 (2 laser channels)	10
LASMIK-02 (4 laser channels)	15
LASMIK-03 (1 laser and vacuum channel)	12
The average operation period without maintenance service, h	5000
The warranty*	5 years

* For the base unit and IR-pulsed laser emitting heads, 12 months for the rest products.

The Comparison of the Parameters

of the laser emitting heads for the devices of new and previous generation

The devices of new generation of LASMIK® ("LASMIK", "Agiur", "LASMIK-ILBI", "LASMIK-BIO", etc.) technology			The devices of previous generation ("Matrix", "Matrix-Urolog", "Mustang-2000", etc.)		
	Parameters			Parameters	
Head name	Wave-length, nm	Power	Head name	Wave-length, nm	Power
ML01K (ML-904-80)	904	50 W (matrix)	ML01K	890–904	50 W (matrix)
ML01KM (ML-904-200)	904	200 W (matrix)	–	–	–
ML01KP (ML-635-40)	635	35 W (matrix)	ML01KR	650–670	35 W (matrix)
ML-650-100	650	100 mW (matrix)	–	–	–
LO-890-10 (LO-904-10)	904	10 W	LO1	890–904	5 W
LO-890-15 (LO-904-15)	904	15 W	LO2	890–904	10 W
LO-890-20 (LO-904-20)	904	20 W	LO3	890–904	15 W
LO-890-25 (LO-904-25)	904	25 W	LO4	890–904	20 W
LO-890-100 (LO-904-100)	904	100 W	LO7	890–904	90 W
LOK2 (LO-635-5)	635	5 W	LOK2	650–670	5 W
KLO-405-120	405	120 mW	KLO-405-120	405	120 mW
KLO-450-50 (KLO-445-50)	445–450	50 mW	–	–	–
KLO-530-50 (KLO-525-50)	520–530	50 mW	–	–	–
KLO-635-5	635	5 mW	KLO1	635	5 mW
KLO-635-15	635	15 mW	KLO3	635	10 mW
KLO-635-40	635	40 mW	KLO4	635	40 mW
KLO-635-50 (NLBI)	635	50 mW	–	–	–
KLO-650-50	650	50 mW	KLO2	650	40 mW
KLO-650-200	650	200 mW	–	–	–
KLO-780-90	780–785	90 mW	KLO-780-90	780–785	90 mW
KLO-808-200	808	200 mW	KLO6	808	200 mW
KLO7	1300	5 mW	KLO7	1300	5 mW
KL-ILBI-365-2 (for UVBI)	365–400	1,5–2 mW*	KL-ILBI-365	365–400	1,5–2 mW*
KL-ILBI-405-2	405	1,5–2 mW*	KL-ILBI-405	405	1,5–2 mW*
KL-ILBI-450-2 (KL-ILBI-445-2)	445–450	2 mW*	–	–	–
KL-ILBI-450-20 (KL-ILBI-445-20)	445–450	20 mW*	–	–	–
KL-ILBI-530-2 (KL-ILBI-525-2)	520–530	2 mW*	–	–	–
KL-ILBI-530-20 (KL-ILBI-525-20)	520–530	20 mW*	–	–	–
KL-ILBI-635-2	635	2 mW*	KL-ILBI	635	2 mW*
KL-ILBI-635-20	635	20 mW*	KL-ILBI-M	635	20 mW*
KL-ILBI-808-40	808	40 mW*	KL-ILBI-IR	808	40 mW*

* At the output of the light guide KIVL-01 produced by the Research Center "Matrix" under TR 9444-005-72085060-2008.

Laser emitting heads of new generation

With one laser
on the left

The heads are used for the external exposure through the local contact with the mirror nozzle, distant or contact without a nozzle, and with optic and magnetic nozzles. The heads are made in accordance with brand new technologies from special heavy-duty plastic, do not break, crack or crash – they are more reliable than those made from metal.
Designation: TYPE (LO – pulsed, KLO – continuous) – wavelength – power.
For example, LO-904-20 – pulsed laser emitting head with the wavelength of 904 nm (IR) and maximum power of not less than 20 W (can be adjusted downwards).

Matrix
in the middle

Designation: TYPE (ML) – wavelength – power.
Matrix emitting heads with 8 pulsed laser diodes of IR (904 nm) or red spectrum are most often used. Detailed information is given further.

For intravenous laser blood illumination (ILBI)
on the right

Designation: KL-ILBI – wavelength – power.
Detailed information is described below.

All laser emitting heads are attached to the device with the help of convenient, modern and extremely reliable LASMIK® connectors specially designed for laser therapy devices.

Matrix laser emitting heads

These are necessary for the optimization of the impact area and the energy density of the impact, laser diodes are located on the surface so that the light fields created by them separately when combining ensure the best spatial-energy parameters of the technique as a whole [Moskvin S.V., 2008, 2014].

Such heads have maximum versatility and can be implemented practically in all the laser therapy techniques, except acupuncture, that is why they are included in the simple kits of the equipment. They are used for the external application as well as for the impact on the projection of the internal organs, located at the depth up to 15 cm (IR-lasers).

Parameters	ML-904-80 (ML01K)	ML-904-200 (ML01KM)	ML-635-40 (ML01KR)
Wavelength, nm	904	904	635
Spectrum (colour)	IR	IR	red
Number of laser diodes, pcs.	8	8	8
Pulse power, W	80	200	40
Impact area, cm^2	8–50	8–50	8–50
Available analogues	Conditionally	No	No

Laser diodes in the modern matrix laser heads ML-904-80, ML-904-200 and ML-63540 are made under the LASMIK® technology, and are located right on the surface, not behind any glass (no distance), which can significantly improve the efficiency of impact efficiency with a lower number of laser sessions. The square of the light spot, according to which the power density is calculated, at the distance up to 0,5 cm from the LD is 8 cm^2, that is 8 light sources can be presented with the sum of 8 laser heads with one laser and mirror nozzle. At the distance of 7 cm (limit) a pretty much rectangular area with the size of 5×10 cm is formed and the power density is calculated taking into consideration the aggregate capacity of all the laser diodes on the square of 50 cm^2.

The laser emitting head ML-635-40 (ML01KR) is mostly used for the technique of non-invasive (external, transdermal) laser blood illumination with the unique efficiency and for the illumination of the pathological focuses at the depth of up to 5 cm.

The laser emitting head LO-LLNP contains 4 separate blocks with 3 continuous red and 2 pulsed IR LDs, so, in this case the matrix emitter is not flat, but volumetric. The boards are on the flask opposite each other, as a result, all sides of a penis are equally illuminated.

Matrix emitting heads with continuous laser diodes are rarely used.

Laser emitting heads for intravenous laser blood illumination (ILBI)

Name	Wavelength, nm	Power*, mW
Laser emitting head KL-ILBI-365-2 (for UVBI)	365–400	2
Laser emitting head KL-ILBI-405-2	405	2
Laser emitting head KL-ILBI-450-2 (KL-ILBI-445-2)	445–450	2
Laser emitting head KL-ILBI-450-20 (KL-ILBI-445-20)	445–450	20
Laser emitting head KL-ILBI-530-2 (KL-ILBI-525-2)	520–530	2
Laser emitting head KL-ILBI-530-20 (KL-ILBI-525-20)	520–530	20
Laser emitting head KL-ILBI-635-2	635	2
Laser emitting head KL-ILBI-635-20	635	20
Laser emitting head KL-ILBI-808-40	808	40

* At the output of the light guide KIVL-01 produced by the Research Center "Matrix".

- **Only lasers for the laser blood illumination!** (No cheap and inefficient LEDs or outdated lamps are used!)
- **Laser light energy is better brought into the light guide** (the greater the power, the better the effect).
- **The convenient housing** (allows easy inserting and removing of the light guide).
- **Has a special laser illuminator** (it does not have contact with the patient and does not cause negative feelings).
- **Optimal dimensions** allow using shorter light guides (to 20 cm) while keeping polarization of light.
- **A special reliable and durable strap** (can be disinfected and sterilized).
- **Straps and connectors match the colour (wavelength) of the laser source** (to avoid mistakes while choosing the head during the procedure).

Heads for non-invasive (external) laser blood illumination (NLBI)

Our studies (1997–2014) have proven that the best option for non-invasive (external) laser blood illumination (NLBI) is the application of the matrix emitting head ML01KR (ML-635-40) on the projection of large blood vessels close to an injured area, in which pulsed lasers in the red spectrum (635nm) are used [Moskvin S.V., 2014; Moskvin S.V. et al., 2007].

Nevertheless, some specialists prefer to illuminate exactly the projection of the cubital vein, the area through which ILBI is most often implemented. In this case it is necessary to have a special emitting head with much more power as the laser light energy is ten times weakened under such method of delivery.

KLO-635-50 (NLBI)

Basic features

- Laser wavelength – 635 nm (red spectrum).
- Average power – 50 mW.
- Fastened with a special strap on the arm or on the knee above the projection of the vessels.
- A special appliance for power density optimization and stabilization.

Laser-LED matrix emitting head MLS-1 (Effect)

This head is more often used for the systematic exposure on the body, for external laser illumination technique or colour therapy.

Basic features

- The availability of several light sources with a different wavelength (colour).
- The total area of the light spot at the distance of 1 cm – to 40 cm^2.
- The possibility of the modulation of the LED illumination of any frequency, set on the base unit.
- The possibility of LED or laser switching when all the other light sources are disconnected.
- The use of pulsed lasers of infrared (IR) or red spectrum.

The parameters of the light sources of the emitting head MLS-1 (Effect)

Colour	Wavelength, nm	Type	Number, pcs.	Illumination mode	Total illumination power
Blue	470	LED	12	cont./mod.	20 mW*
Green	530	LED	3	cont./mod.	10 mW*
IR	850–960	LED	4	cont./mod.	60 mW*
Red	635	Laser	3	Pulsed	15 W**
IR	904	Laser	1	Pulsed	10 W**

* For the continuous illumination mode, for the modulated mode the average power is two times decreased.
** Pulse power.

LASMIK® connectors – maximum reliability

Name	Wave-length, nm	Connector (colour)
Matrix laser emitting head ML01K (ML-904-80)	904	
Matrix laser emitting head ML01KM (ML-904-200)	904	
Laser emitting head LO-890-10 (LO-904-10)	904	
Laser emitting head LO-890-15 (LO-904-15)	904	
Laser emitting head LO-890-20 (LO-904-20)	904	
Laser emitting head LO-890-25 (LO-904-25)	904	
Laser emitting head LO-890-100 (LO-904-100)	904	
Laser emitting head KLO-780-90	780–785	
Laser emitting head KLO-808-200	808	
Laser emitting head KLO7	1300	
Laser emitting head KL-ILBI-808-40	808	
Laser emitting head KLO-405-120	405	
Laser emitting head KL-ILBI-405-2	405	
Laser emitting head KL-ILBI-365-2 (for UVBI)	365–400	
Matrix laser emitting head ML01KR (ML-635-40)	635	
Laser emitting head LOK2 (LO-635-5)	635	
Laser emitting head KLO-635-5	635	
Laser emitting head KLO-635-15	635	
Laser emitting head KLO-635-40	635	
Laser emitting head KLO-635-50 (NLBI)	650	
Laser emitting head KLO-650-50	650	
Laser emitting head KLO-650-200	650	
Laser emitting head KL-ILBI-635-2	635	
Laser emitting head KL-ILBI-635-20	635	
Laser emitting head KLO-450-50 (KLO-445-50)	445–450	
Laser emitting head KL-ILBI-450-2 (KL-ILBI-445-2)	445–450	
Laser emitting head KL-ILBI-450-20 (KL-ILBI-445-20)	445–450	
Laser emitting head KLO-530-50 (KLO-525-50)	520–530	
Laser emitting head KLO-530-50 (KLO-525-50)	520–530	
Laser emitting head KL-ILBI-530-20 (KL-ILBI-525-20)	520–530	

Universal equipment stand LASMIK-SF

The development of laser physiotherapy requires several devices to be implemented in a conjoined and combined procedure in one workplace. The techniques of laser-vacuum massage, EHF-laser therapy, vibromagnetic laser massage, local laser negative pressure (LLNP), laser biorevitalisation have been actively developing, and recently are gaining more and more popularity. For their successful implementation it is necessary to have different devices, nozzles, gels, etc. at hand. A new specialized equipment stand has been designed for physiotherapy rooms in medical institutions and cosmetology centres (salons).

Special holders are designed for the emitting heads and nozzles for laser and physical therapy devices “Matrix”, “LASMIK”, “Agiur”, “Matrix-ILBI”, “Matrix-Urolog”, “Matrix-VM”, etc.

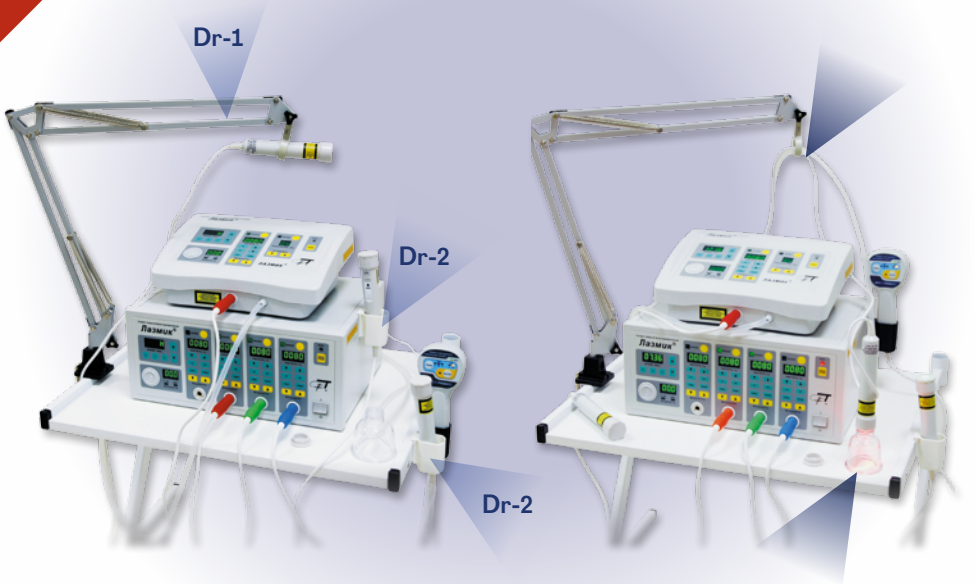
The characteristics of the equipment stand LASMIK-SF

- It allows the setting of several different devices (laser, vacuum, BIO, etc.) in one place and combining (conjoining) different types of physiotherapy exposure.
- It is convenient and ergonomical.
- Methodical references and records are always at hand.
- There are several shelves for nozzles, accessories and storage of the supplies.
- There are specific holders for 5 laser emitting heads.
- Castors make the stand easy to move around the medical centre.

Emitting head holder

BRAND NEW!

The holder is designed to clasp the emitting heads at the place of the illumination or to keep (fix) them between procedures, there are two options available: Dr-1 and Dr-2.



Holder Dr-1 is designed to arrange an emitting head on the place of the implied exposure, for this purpose it is fixed in a special ring (the photo on the left at the top), it is also used for the vertical fixation of the power cord of an emitting head and a vacuum tube (the photo on the right with the arrow up) while implementing laser-vacuum massage procedures (the photo on the right the arrow down). Illumination from above eliminates patients' unpleasant feelings caused by the cord and tube slipping on the body and increases the reliability of the operation of the laser-vacuum apparatus.

Holder Dr-2 is fixed to the metal surface of the 4-channel option of "Matrix", "LASMIK" and "Matrix-Urolog" devices or to the side surface of the stand with the magnetic lock, it is designed to fix (keep) the emitting heads between procedures, for this purpose they are located in the holder cavity.

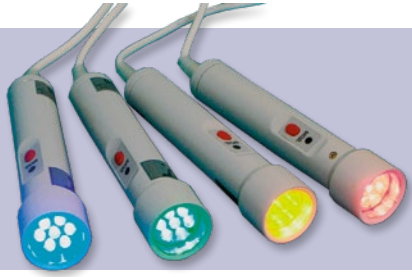
You should not direct a laser emitting head to the eyes or to the glare surfaces of the surrounding things with the help of the Dr-1. It is necessary to shut the emitting heads with a special protective cover while fixing (keeping) them in Dr-2.

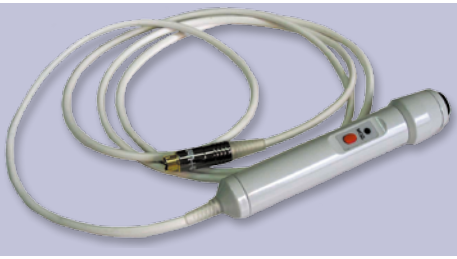
Special emitting heads

BRAND NEW!

The IR (wavelength – 904 nm) pulsed laser emitting head of the increased power (up to 300 W) ML01KM is designed to treat diseases such as gout, psoriasis, prostate adenoma, etc.

We continue producing matrix LED heads for all the devices of "Matrix" and "LASMIK" series. They are much less efficient than laser light sources, but are used in some techniques for psycho- and colour therapy.





The emitting heads of EHF-range can be connected to all devices of "Matrix" series. The conjunction and combination of different physical healing factors make it possible to increase efficiency of the treatment.

A special acupuncture nozzle (concentrator) is used to implement EHF-acupuncture.

Expendable materials and nozzles for individual use

The advantages of individual flasks for the local laser negative pressure (LLNP) technique or for the laser-vacuum massage

1. A patient's complete safety is ensured with the use of the individual flasks.
2. Patients are more willing to undergo the procedure having been informed about such a possibility.
3. The use of the individual flasks is an additional income for the medical centre.

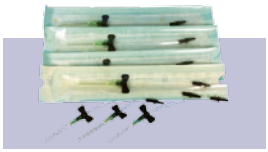
New vacuum cup attachments for laser-vacuum massage (KB-5) – now 7 pieces!

The nozzles for the operation on a face – FVM-25 and FVM-15, diameter of 25 and 15 mm correspondingly, are additionally supplied.

Most patients prefer procedures implemented with the help of individual nozzles (cups), that is why there is a possibility to buy nozzles with a discount.

Slot nozzle FVM-S

Light guides KIVL-01 for the intravenous laser blood illumination (ILBI)



The peculiarities of the sterile light guides KIVL-01 of the Research Centre "Matrix" produced in accordance with TR 9444-005-72085060-2008:

- super-sharp injection needles are painless and ensure patients' maximum comfort;
- the light guide with the diameter of 500 μm ensures stable exposure parameters while preserving the initial illumination polarization and maximum therapeutic effect;
- the high ratio of the input of the laser light into the fiber ensures high and stable power at the light guide output;
- does not damage the laser diode in the emitting head.

ATTENTION! Only light guides KIVL-01 produced in accordance with TR 9444-005-72085060-2008 can be used with "Matrix" and "LASMIK" devices! Other light guides cannot ensure the stable illumination power and positive results of the treatment, and can cause emitting head failure.

A disposable filtration system F-1 for the vacuum therapy devices "Matrix-VM" or laser-vacuum therapy "LASMIK-03"

The filter is designed to protect the device from the penetration of foreign substances (oil, lotion, saliva etc.) inside the pump. The filter works within the period of 7 to 30 days, depending on the intensity and operating conditions, that is why it is recommended to change the filter weekly. Late filter replacement can cause the device to fail, and the necessity to repair it (which is expensive).

Laser physiotherapy device LASMIK®

This is the only medical device which has 8 wavelengths for laser cosmetology and medicine – 405, 445, 525, 635, 785, 808, 904, 1300 nm.

The laser emitting head KLO-780-90 (780–785 nm, 90 mW) and cosmetology transparent attachment LASMIK® is designed to implement laser phoresis (biorevitalization according to LASMIK® technology).

Now the set of vacuum cups attachments for the vacuum and laser-vacuum massage KB-5 contains special nozzles for the face FVM-25 and FVM-15 with the diameter of 25 and 15 mm. Special shockproof material on the basis of polycarbonate is used for the production of the nozzles. The nozzles cannot be broken or scratched, they are easy to wash and sterilize. Optimum geometric dimensions allow achieving the maximum technique effect.

Special apparatus gels and masks:
LASMIK® hyaluronic acid gel;
LASMIK® anti-cellulite gel;
LASMIK® revitalizing mask.

New formula – better quality!

Prices are now lower, and there are discounts available to regular customers.

Attachments, “Matrix-BIO”, protective glasses

Optic and magnetic attachments

These attachments allow the implementation of laser illumination with a pathological focus. This results in minimal loss, and with the required shape and field area, allow the implementation of magnetic laser therapy.

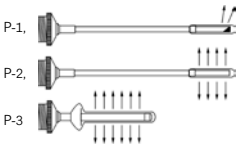
External modulation unit “Matrix-BIO”

It can operate with all the devices, and increases the efficiency of laser therapy through the synchronization of the exposure with a patient’s biorhythms.

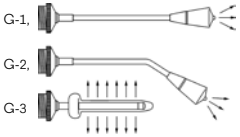
Protective glasses

The glasses are used to protect the medical staff from the reflected illumination during the procedure; the glasses are of modern design, light and comfortable.

Proctology nozzles

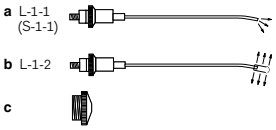


Gynecology nozzles

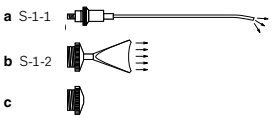


U-1 Urology nozzle for the heads of LO type

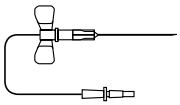
The set of otolaryngology nozzles: a – L-1-1 (S-1-1); b – L-1-2; c – adapter



The set of stomatology nozzles: a – S-1-1, b – S-1-2, c – adapter

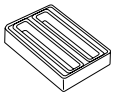


A disposable light guide with a needle for ILBI



A mirror magnet nozzle attachment ZM-50 for the heads of LO and KLO type

Mirror magnet nozzle attachment MM-50



Mirror nozzle attachments

Acupuncture nozzle attachment A-3

“Matrix-ILBI” laser therapy device (upgraded)

Digital indication of the laser illumination wavelength.

The connector under TRS standard 6.35 mm stereo (LASMIK®), the colour of the connectors and fastening straps of the KL-ILBI heads corresponds with the laser illumination wavelength. This helps to avoid mistakes during procedures and the use of all types of laser emitting heads for ILBI.

The operation with pulsed laser emitting heads is allowed. Now it is possible to carry out not only intravenous laser blood illumination procedures (ILBI) with the help of specialized disposable sterile light guides with KIVL-01 needle under TR 9444-005-72085060-2008, but also other laser therapy techniques: external illumination, non-invasive (transdermal) laser blood illumination (NLBI), acupuncture, projection on to the internal organs, para-verbal, intracavitary illumination, etc.

Name	Wavelength, nm	Spectral range	Illumination power at the output of the light guide KIVL-01 TR 9444-005-72085060-2008, mW
KL-ILBI-365-2 (for UVBI)	365	UV	2 mW
KL-ILBI-405-2	405	UV	2 mW
KL-ILBI-445-2	445–450	Blue	2 mW
KL-ILBI-450-20	445–450	Blue	20 mW
KL-ILBI-525-2	520–525	Green	2 mW
KL-ILBI-525-20	520–525	Green	20 mW
KL-ILBI-635-2	635	Red	2 mW
KL-ILBI-635-20	635	Red	20 mW
KL-ILBI-808-40	808	IR	40 mW

“Matrix-Urolog” laser therapy device

“Matrix-Urolog” device (apparatus) is made under the block principle [Moskvin S.V., 1993–2003], according to which the complex is most often located on the stand LASMIK-SF, it consists of three parts: base unit, emitting heads and nozzles (magnetic and optical).

Name of the equipment recommended in the set	Number, pcs.
ALT “Matrix-Urolog” (3-channel specialized base unit)	1
Vibromagnetic laser head VMLH10 to cure prostatitis	1
Laser emitting head LO-904-20 (pulsed IR, 890–904 nm, 15–20 W)	2
Laser emitting head KLO-635-15 (continuous red, 635 nm, 15 mW)	1
Laser emitting head ML-904-80 (pulsed IR, 890–904 nm, matrix)	1
Attachments/nozzles (set): P-1, P-2, P-3, U-1, ZN-35 (2 pcs.), MM-50, ZM-50	1
The book: Laser therapy in urology. – M., 2009. – 132 p.	1
“Matrix-VM” vacuum massage apparatus	1
The laser emitting head LO-LLNP to cure the patients with erectile disfunction and prostatitis (matrix, 12 continuous lasers of 635 nm, power ≥60 mW and 10 IR lasers, pulsed, ≥70 W). Made under new technology, operates up to the frequency of 10 000 Hz, TRS 6.35 mm stereo connectors.	1
The flask for the local laser negative pressure technique B-LLNP (3)	2

The emitting heads and nozzles of “Matrix-Urolog” complex

It is possible to expand the set with different emitting head and nozzles, which will allow for a more efficient treatment together with the use of the base emitting heads recommended for “Matrix-Urolog” laser therapy device.

Vibromagnetic laser head VMLG10

The unique vibromagnetic laser head of VMLG10 complex, which is used to cure the patients with prostatitis, is a rectal attachment with a ring magnet with the induction of 25 mT and a laser illumination diffuser (wavelength of 635 nm, power of 10 mW).

“Matrix-LLNP” complex

It is possible to include the set for the treatment of the patients with erectile disfunction with the help of local laser negative pressure technique into “Matrix-Urolog” complex. “Matrix-LLNP” complex contains:

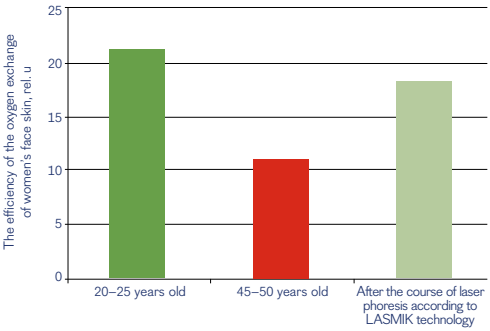
- “Matrix-VM” or “LASMIK-03” vacuum massage apparatus;
- the laser emitting head LO-LLNP;
- special flasks B-LLNP (2 pcs.).

ATTENTION! The lasers of red and IR spectrum are precisely used in LO-LLNP emitting head while ineffective cheap light diodes are used in “analogues”. Moreover, laser illumination of the red and the infrared spectrum is alternated in accordance with the biological rhythms, which ensures a more adequate response of important regulatory, vascular and immune systems.

“LASMIK-Cosmetolog” complex

This unique medical device has eight wavelengths for laser cosmetology and medicine – 405, 445, 525, 635, 785, 808, 904, 1300 nm and the most comprehensive set of special nozzles.

The low price of the basic kit allows for the significantly expanding number of potential clients!



The effects of laser biorevitalization under LASMIK® technology are scientifically substantiated!

The results of the research conducted have proved that the efficiency of the oxygen exchange of skin cells, which decreases dramatically with age, can recover up to the particular to people who are 20–25 years younger. The lipofuscin content is decreased and the structure of collagen and elastin is improved.

Laser emitting heads KLO-780-90 (wavelength of 780–785 nm) and KLO-405-120 (wavelength of 405 nm) with a cosmetology nozzle for the laser biorevitalization and hyaluronoplasty techniques.
LASMIK® gel with hyaluronic acid
LASMIK® anti-cellulite gel
LASMIK® revitalizing mask
Glasses for eye protection from laser illumination during face procedure

The unique training and methodological support, master classes, specialization in laser medicine, field training, individual training, books, training videos, etc.

LASMIK-Slim laser weight loss program without any diet or fitness

LASMIK-Slim is a unique body shape corrector and weight loss program which gives patients the opportunity to not only improve their body shape and skin properties, but also to lose weight and keep it off for a long time without any diets or excessive physical activity. It is based on physiotherapy procedures, the exposure is implemented with the low-intensity (low-energy, "cold") lasers, that is why the tissue is not heated up, the fat is not "melted" or "burned", but rather, optimal conditions for its release from adipocytes with further disposal have been created.

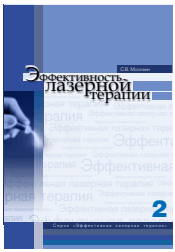
The exposure with the low-intensity ("cold") laser is implemented with the aim to release fats from adipocytes (to reduce fat deposits) with the simultaneous activation of the system of circulation and the metabolising of fatty acids, correction of the energy regulation within the physiological norm.

The LASMIK-Slim program is not only designed to create a slimmer body, but is also the solution to people carrying extra weight as a whole. As a result of the physiotherapy procedures and a patient's implementation of some simple recommendations the shift of the whole complex of the energy balance and the process of metabolism regulation occurs, the transition to the condition under which any spontaneous excess accumulation of fats is not allowed for a long time (up to 6–12 months) is achieved.

Laser physiotherapy complex for LASMIK-Slim program of the body shape correction:

1. **"Matrix-4k"** laser therapy device – 1 pc.
2. **"LASMIK-03"** laser therapy device – 1 pc.
3. Special laser emitting heads – 6 pcs.
   Laser emitting head **KLO-635-5** – 1 pc.
   Laser matrix emitting heads **ML-635-40** – 1 pc.
   Laser emitting head **KLO-650-50-1** – 2 pcs.
   Laser emitting head **KLO-650-50-4** – 2 pcs.
4. Cosmetology nozzles – 15 pcs.
5. Emitting head clamps on the body of a patient – 1 set.
6. **LASMIK-SF** stand with the emitting head holders – 1 pc.
7. The guidelines and individual training.

Laser medicine references



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The organization of training for the medical staff with higher and secondary education, short-term professional development on the program "Laser medicine"

Research Center “Matrix”

Research Center «Matrix» designs and produces physiotherapy equipment, carries out scientific research and does everything to implement the most efficient techniques. Dozens of patients, scientific articles, guidelines, books, theses, etc. prove the leadership of the centre in this field of medicine and cosmetology.

Laser therapy devices of the “Matrix” and “LASMIK” series are the most versatile. Laser physiotherapy complex does not have any analogues and is successfully used by specialists for the treatment of prostatitis, erectile dysfunction, etc. “Matrix-Cosmetolog” and “LASMIK” have been used for many years by cosmetologists and dermatologists in their practice, these are the only devices for laser biorevitalization, which are registered in Russia as medical devices. “Matrix-ILBI” device allows implementation of intravenous laser blood illumination with red and ultraviolet spectrum (ILBI+LUVBI technique). Our center is the only one which produces the laser emitting head KL-ILBI-365 for LUVBI. Long-term clinical studies carried out together with the leading medical centers proved the unprecedented high efficiency of the method. Scientific developments of the center ensure the professionals’ successful work. We do not stop there, doctors collaborating with us can take part in conferences and seminars, can constantly get consultations on the most efficient latest therapy techniques and books from new “Effective laser therapy” series.

The scientific supervisor is **Sergey V. Moskvin**, Doctor in Biology, Candidate of Engineering Sciences, leading researcher of the State Research Center of Laser Medicine FMBA of Russia, Professor at the Department of Rehabilitation Medicine of the Institute of Professional Development FMBA of Russia, Professor of Samara Medical Institute “REAVIZ”. He is the author of more than 30 patents for invention and 500 scientific studies, including 50 monographs mainly in the sphere of the research of the mechanisms of biological effect of low-intensity laser illumination and clinical application of laser therapy (in co-authorship with the leading specialists in different fields of medicine). The email address to contact for any advice on laser therapy application: 7652612@mail.ru

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