



## Intravenous (blood laser therapy) and cardiovascular studies:

### [The application of intravenous laser irradiation of the blood for the combined treatment of psoriasis].

[Article in Russian] [Vopr Kurortol Fizioter Lech Fiz Kult.](#) 2012 Jan-Feb;(1):24-8. [Shakhova AS](#), [Kulikov AG](#), [Korsunskaja IM](#).

#### Abstract

The objective of the present comparative study was to estimate the efficacy of the treatment of 104 patients presenting with psoriasis with the use of PUVA therapy and intravenous laser irradiation of the blood or the combination of the two methods. It was shown that the latter treatment caused a faster reduction of the inflammatory processes than the former whereas their joint application was especially efficacious in inducing regression of concomitant infiltrative events. Erythrocytes from the patients undergoing intravenous laser irradiation of the blood were characterized by the enhanced activity of antioxidative enzymes that are known to play an important role in the cellular protection from oxidants. At the same time, PUVA therapy caused no appreciable changes in the antioxidative status. Both treatments increased the levels of antiinflammatory cytokines and decreased those of proinflammatory ones which suggests their immunomodulatory effect that was especially pronounced in the case of combined therapy. It is concluded that the introduction of intravenous laser irradiation of the blood in the combined treatment of psoriatic patients exerts positive effect on compromised immunoregulation, stimulates the antioxidative system, and improves microcirculation.

PMID: 22693740[PubMed - indexed for MEDLINE]

### Intravascular laser therapy (IVL) in pre-hypertension and hypertension conditions.

S. Mokmeli MD, Sh. Bishe, Kh. Kahe, M. Shakhes Laser Department of Milad Hospital. Hemmat Exp way , Chamran Exp. Way , Tehran , 119/ 1449614531, Iran, [mokmeli@gmail.com](mailto:mokmeli@gmail.com) This study was presented in In 7<sup>th</sup> international WALT congress, south Africa, 2008

*Introduction:* "Hypertension," is a condition that afflicts almost 1 billion people of worldwide and it is called the silent killer because it usually has no symptoms. Some people may find it out when they have trouble with their heart, brain, or kidneys. Intravenous laser therapy (IVL) is a technique of low level laser therapy that is pioneered in Russia and refers to blood irradiation through an intravenous needle or transcutaneous venous irradiation. IVL increases oxygen content, reduces the partial pressure of carbon dioxide and thrombocyte aggregation, stimulates fibrinolysis, and normalizes tissue metabolism... The aim of our study was evaluation the immediate effects of IVL in different grades of blood pressure.



*Material and Method:* Nowadays, since attention has been focused on systolic BP as a predictor of coronary and cerebrovascular disease, we allocated 125 patients according to the systolic blood pressure in 3 groups: 1-Normotensive (<120 mmHg n=50), 2-Pre-hypertensive (120-139 mmHg n=50), 3- hypertensive (stage I =140–159 mmHg, n=25). All the groups were conducted for 30 minutes IVL with a 630 nm, continues laser in 2.5 mW power at the end of intravenous fibre. Pulse rate, systolic, diastolic, and pulse pressures were measured before, after, and 15 minute after the IVL. All the results were analyzed by spss program.

*Results:* There was no statistically significant difference for pulse rate, systolic and diastolic blood pressure in normotensive group, however the significant difference was observed for pulse rate, systolic and diastolic blood pressure in Pre-hypertensive group as for systolic and diastolic blood pressure in hypertensive group(  $p < 0.005$ ).

*Conclusion:* IVL is an effective method for modifying factors to result a reduction in arterial pressure. It can be combined with anti hypertensive drugs in Pre-hypertensive and hypertensive patients as a modality of treatment; also it is a safe method in normotensive patients.

## **[The development of method of intravenous laser irradiation of blood with green laser in patients with hyperlipidemia].**

[Article in Russian] [lin Lab Diagn.](#) 2011 Aug;(8):15-7.

[Poluéktova MV](#), [Kharchenko IL](#), [Kaplan MA](#), [Sokol NI](#), [Ershova LM](#), [Borgul' OV](#), [Chirkova TV](#), [Vorob'eva OA](#).

### **Abstract**

The impact of intravenous laser irradiation of blood with green laser in patients with hyperlipidemia was investigated. The blood of patients was chosen as sample for analysis. The patients were divided in two groups: patients with atherosclerosis of various localization and patients with atherosclerosis associated with diabetes mellitus. The effectiveness of laser impact was evaluated according the blood biochemical indicators. The levels of crude cholesterol, triglycerides, low and very low density lipoproteins, apoproteins A and B, highly sensitive C-reactive protein, atherogenity indicator, glucose content, uric acid content were determined befor and after 1, 3 and 6 months after impact. The study results indicate the occurrence of hypolipedemic and hypoglycemic effects. PMID:22164411[PubMed - indexed for MEDLINE]

## **Effect of intravenous laser irradiation of the blood on plasma content of ceruloplasmin in patients with chronic pancreatitis.**

[Bull Exp Biol Med.](#) 2010 Nov;149(6):697-8.[Burduli NM](#), [Gutnova SK](#).

Department of Therapy, Advanced Training and Professional Re-Training Faculty, North Ossetian State Medical Academy, Federal Agency for Health Care and Social Development, Vladikavkaz, Russia.

### **Abstract**

Ceruloplasmin content in the blood plasma significantly increased in patients with chronic pancreatitis during exacerbation of the disease. Addition of intravenous laser irradiation of the blood to complex therapy of patients with chronic pancreatitis normalized ceruloplasmin content in the plasma.

PMID:21165421[PubMed - indexed for MEDLINE]



## **Basic study of charring detection at the laser catheter-tip using back scattering light measurement during therapeutic laser irradiation in blood.**

[Takahashi M, Ito A, Kajihara T, Matsuo H, Arai T. \*onf Proc IEEE Eng Med Biol Soc.\* 2010;2010:2759-61.](#)

School of Fundamental Science and Technology, Graduate School of Science and Technology, KEIO University (Japan).

### **Abstract**

The purpose of this study is to investigate transient process of the charring at the laser catheter-tip in blood during therapeutic laser irradiation by the back scattering light measurement to detect precursor state of the charring. We took account of using photodynamic therapy for arrhythmia in bloodthrough the laser catheter. We observed the influence of the red laser irradiation ( $\lambda=663$  nm) upon the shape of red blood cells (RBCs). The RBCs aggregation, round formation, and hemolysis were took place sequentially before charring. With a model blood sandwiched between glass plates simulated as a catheter-tip boundary, we measured diffuse-reflected-light power and transmitted-light power simultaneously and continuously by a microscopic optics during the laser irradiation. We found that measured light power changes were originated with RBCs shape change induced by temperature rise due to the laser irradiation. A gentle peak following a slow descending was observed in the diffuse-reflected-light power history. This history might indicate the precursor state of the charring, in which the hemolysis might be considered to advance rapidly. We think that the measurement of diffuse-reflected-light power history might be able to detect precursor state of charring at the catheter-tip in blood.

PMID:21096215[PubMed - indexed for MEDLINE]

## **Intravenous laser irradiation of blood in the complex treatment for acute and progressive tuberculosis in adolescents**

[Rusakova, L. I.; Dobkin, V. G.; Ovsyankina, E. S.; Firsova, V. A.; Bondarev, G. B.;Sidorov, V. A. \*Proc. SPIE Vol. 4422, p. 102-105, Low-Level Laser Therapy, Tatiana I. Solovieva; Ed.\*](#)

Twenty-three out of forty-four adolescents affected by acute and progressive tuberculosis were administered a complex treatment based on the intravenous laser irradiation of blood. This treatment started 2 to 4 weeks after the beginning of chemotherapy. The efficiency of the treatment was assessed by clinical and laboratory criteria obtained after 1.5 to 2 months. It was found that the application of ( $\lambda$ ) equals 0.63 micrometers laser irradiation increased the therapeutic effect and stimulated the healing of the disease. Moreover, it enabled the achievement of a quiet course of tuberculosis with less pronounced residual changes in the lungs.



## Direct rheological, cytometric, and cardiological effect of intravenous laser irradiation of blood

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**Publication** Journal of Engineering Physics and Thermophysics, Volume 81, Issue 6, pp.1207-1213  
11/2008

**Abstract:**As a result of the first session of intravenous laser irradiation of blood, it has been established that changes in the blood cellular elements, according to the data of cytometry, and in the blood and plasma viscosity are analogous to the changes occurring when a blood specimen is being incubated at a temperature of 48°C for 1 h or during its storage for 18 days at 12°C in a refrigerator: average dimensions of leukocytes decrease, thrombocytes decline in number, the deformability of erythrocytes is impaired, and the viscosity of the blood increases. Analogous changes in the cytometric and rheological indices, as well as a small hemolysis of erythrocytes, were observed on irradiation of a blood specimen in vitro. The suggestion has been made that the therapeutic effect of intravenous laser irradiation of blood is due to the generation of young cellular elements and their ejection into the blood channel instead of those damaged by the laser radiation.

**Title:** **The influence of intravenous laser irradiation of blood on some metabolic and functional parameters in intact rabbits and experimental cerebral ischaemia**

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**Publication:** Therapeutic Laser Applications and Laser-Tissue Interactions III. Edited by Vogel, Alfred. Proceedings of the SPIE, Volume 6632, pp. 66320K (2007). ([SPIE Homepage](#))

**Publication Date:** 06/2007

**Origin:** [SPIE](#)



## Abstract

It has been studied the intravenous laser irradiation of blood (ILIB) influence with helium-neon laser (HNL) of 630 nm wavelength on some of lipid peroxidation (LPO) and antioxidant system (AOS) findings, aside-base status (ABS) and blood oxygen transport (BOT), state of dermal microhaemodynamics (MGD) in the intact rabbits and after modeling of local ischemia of brain (LIB). Depending on conditions of organism functioning (norm or brain ischaemia) ILIB has resulted in stimulating or normalizing effects on the whole metabolic and microhaemocirculation processes which had been studied during our investigation. It is discussed the mechanisms of pathogenetic directivity of ILIB influence in cerebral ischaemia

### **Use of IV Laser Blood Irradiation in sport performance. Case study.**

*ISLA – Medical Laser Application in University of Marburg, 12 – 13 November 2011.*

Stress test indicates the ability of the heart to respond to strenuous exercise program. Heart rate recovery is a measurement of how much heart rate falls during first minute after peak exercise. This case study demonstrates the difference in heart performance during stress test before and after Intravenous Laser Blood irradiation.

Male athlete, 40 years old in preparation for a marathon underwent Intravenous Laser Blood Irradiation with the “Weberneedle® blood system using a HeNe diode laser of two colours: 658 nm (red light) and 532 nm (green light) with power of 5mW and continuous frequency (CW) to improve his endurance. Resting HR 38bpm, Maximum HR 175bpm, Reserve HR 137bpm.

Finger Pulse Oxymeter was used to assess blood oxygenation. Pola S625X training computer was used to record heart rate during the exercise program aiming to determine the effect on heart rate and performance.

Training program was designed to strengthen the heart. It consisted of two parts: after 10 minute warm up, the first part was running to maximum effort for 4 minutes, stop for 90 seconds and repeating 4 times. SpO<sub>2</sub> was taken before and after each run, where training computer recorded the performance at the base line, after the first treatment and last treatment.

Treatment was given every three days, 20 minutes using red (658 mn) laser light and 5 minutes green (532 mn) laser light, totalling 6 treatments prior the exercise (following day).

Results: Case study showed an increase in blood oxygenation after the exercise from SpO<sub>2</sub> 96% to SpO<sub>2</sub> 99%. During the effort a heart rate was noticeably smoother. The recovery heart rate improved from 86.25s to 71.25s (average means) which is 17.4% improvement.

This single case study indicates a potential for further research with larger participation number and control groups.



**[Intravenous laser irradiation of blood for the combined treatment of patients presenting with chronic sensorineural hearing loss].** [Vestn Otorinolaringol.](#) 2011;(2):43-5. [No authors listed] [Article in Russian]

**Abstract**

A method for the treatment of chronic sensorineural hearing loss (CSNHL) is proposed that includes administration of trental followed by intravenous laser irradiation of blood (IVLBI). The study included 81 patients at the age from 20 to more than 60 years presenting with CSNHL. They were allocated to three groups; the patients in group 1 (n=32) were given trental intravenously followed by intravenous laser irradiation of blood, those of group 2 (n=24) were treated with IVLBI alone while patients of group 3 (n=25) received "traditional" treatment. Audiometric examination and rheoencephalography were carried out before and after therapy. The hearing improved to 18-20 dB in group 1, to 10-15 dB in group 2, and to 10 dB in group 3. The improvement of rheoencephalographic characteristics was documented in the patients of all groups but was especially pronounced in group 1. It is concluded that the proposed method significantly increases the efficiency of treatment of chronic sensorineural hearing loss. PMID:21512485 [PubMed - indexed for MEDLINE]

**[The effect of intravenous laser irradiation of the blood on the brain bioelectrical activity in patients in the postcomatose period].** [Vopr Kurortol Fizioter Lech Fiz Kult.](#) 2000 Mar-Apr;(2):28-31. [Article in Russian] [Idrisova LT](#), [Enikeev DA](#), [Vasil'eva TV](#).

**Abstract**

The article presents clinical data on therapeutic effects of intravenous laser blood irradiation (BI) in severe alcohol intoxication complicated by alcohol coma. BI effectiveness was assessed by EEG changes within 3 postcomatose days. Changes in brain biopotentials in various postcomatose periods were unidirectional. Positive results were achieved after low-intensity laser radiation.

PMID:11094892 [PubMed - indexed for MEDLINE]

**[Diagnostic implications of changed red cell count in low-intensity laser radiation of blood in elderly patients with coronary heart disease]** [Klin Med \(Mosk\).](#) 2002;80(4):31-3. [Simonenko VB](#), [Siuch NI](#), [Vokuev IA](#).

Intravenous laser therapy in combination with medication was conducted in 41 elderly patients with coronary heart disease (633 nm, 1 mW, 124 mW/cm<sup>2</sup>). The study of qualitative and quantitative (osmotic resistance) erythrocyte indices of blood demonstrated the change of erythrocyte number in circulating blood by the third laser procedure. Frequency of these changes correlated with duration of the treatment course. Intravenous laser therapy had a wider spectrum of effects on erythrocyte number than medication. Changes in erythrocyte number in the peripheral blood upon intravenous laser radiation reflects efficiency of treatment of coronary heart disease patients.

PMID: 12043259 [PubMed - indexed for MEDLINE]





**[Antioxidant action and therapeutic efficacy of laser irradiation of blood in patients with ischemic heart disease]** [Vopr Kurortol Fizioter Lech Fiz Kult.](#) 2003 May-Jun;(3):22-5

[Volotovskaia AV](#), [Ulashchik VS](#), [Filipovich VN](#).

Laser irradiation in therapeutic doses (gamma = 632.8 nm, 14 mW) has an antioxidant effect in blood irradiation in vitro as shown by activation of superoxide dismutase (SOD) which is a key enzyme of the antioxidant system (AOS) and suppression of lipid peroxidation. Adjuvant supravascular He-Ne laser irradiation of blood in combined therapy of 82 patients with ischemic heart disease (IHD) produces a positive trend in the clinical picture, hemostasis, lipid metabolism, blood SOD activity. Thereby, this method of laser hemotherapy is recommended for use in IHD patients. The dependence of the treatment results on the initial blood AOS necessitates consideration of AOS state in deciding on laser therapy in this group of patients.

PMID: 12852010 [PubMed - indexed for MEDLINE]

**[A possible mechanism of the hypotensive effect of laser irradiation in patients with ischemic heart disease with arterial hypertension]** [Vopr Kurortol Fizioter Lech Fiz Kult.](#) 2001 Sep-Oct;(5):17-20.

[Vasil'ev AP](#), [Strel'tsova NN](#).

93 patients with ischemic heart disease, 44(47.3%) of them with arterial hypertension, were exposed to laser irradiation (LI). LI was accompanied with lowering of arterial pressure, more prominent in hypertensive patients. Mechanism of the hypotensive effect of laser therapy operates largely through stabilization of the lipid bilayer of the cell membrane demonstrated on the model of erythrocyte.

PMID: 11785330 [PubMed - indexed for MEDLINE]

**[Efficiency of low-intensity laser radiation in essential hypertension]**

[Velizhanina IA](#), [Gapon LI](#), [Shabalina MS](#), [Kamalova NN](#). [Klin Med \(Mosk\)](#). 2001;79(1):41-4

In a placebo-controlled study an antihypertensive activity of low-intensity laser radiation (LILR) was evaluated in 52 males with essential hypertension stage I. The placebo group consisted of 14 matched patients. LILR was used as monotherapy of 10 daily procedures. This treatment significantly lowered systolic, diastolic and mean arterial pressure. Moreover, diastolic arterial pressure did not rise high at submaximal bicycle exercise. Total peripheral vascular resistance also decreased. A good hypotensive effect was achieved in 90.4% cases. Thus, LILR is a highly effective treatment in essential hypertension stage I. Publication Types: [Clinical Trial](#) PMID: 11234266 [PubMed - indexed for MEDLINE]



**[The blood antioxidant system in patients with ischemic heart disease undergoing laser therapy]** [Vopr Kurortol Fizioter Lech Fiz Kult.](#) 1993 Nov-Dec;(6):4-7.

[Zubkova SM](#), [Sorokina EI](#), [Kenevich NA](#), [Tupitsyna Iulu](#), [Minenkov AA](#).

Catalase activity and lipid peroxidation were studied in the sera of patients with coronary heart disease who had been exposed to red and infrared low-energy laser radiation (LLR) applied to the skin projections of the heart and its reflexogenic areas. It was found that the optimal normalizing effect occurred with the red band of LLR applied in the rehabilitative period to patients with prior myocardial infarction concurrent with hypertensive disease and stable angina of functional classes I and II. In functional class III stable angina, infrared LLR had advantages over the red one when they acted on the blood antioxidative system. PMID: 8154120

[PubMed - indexed for MEDLINE]

**[Characteristics of microcirculation and vascular responsiveness in elderly patients with hypertension and ischemic heart disease]** [Klin Med \(Mosk\).](#) 2000;78(3):23-5.

[Abramovich SG](#).

Microcirculation and vascular responsiveness were studied in 52 patients with arterial hypertension and ischemic heart disease versus 48 healthy elderly persons. The patients were found to have defects of the end blood flow in all links of microcirculation, longer and more severe vasoconstriction of conjunctival and skin vessels in response to norepinephrine and cold stimulation tests.

PMID: 10790959 [PubMed - indexed for MEDLINE]

**[The use of infrared laser radiation in the rehabilitation of IHD patients after the surgical revascularization of the myocardium]** [Vopr Kurortol Fizioter Lech Fiz Kult.](#) 1994 Nov-Dec;(6):10-2

[Kniazeva TA](#), [Nagapet'ian VK](#).

Application of epicutaneous infrared laser radiation early in the course of postoperative aftercare of patients with coronary heart disease who have undergone myocardial revascularization contributes to improved functioning of the cardiorespiratory system. The laser therapy is indicated in the absence of serious intra- and postoperative myocardial infarctions, postoperative arrhythmia and mediastinitis.

Publication Types: [Clinical Trial](#) , [Randomized Controlled Trial](#)

PMID: 7762198 [PubMed - indexed for MEDLINE]





**[Arterial hypertension and ischemic heart disease: clinico-echocardiographic aspects]** [Klin Med \(Mosk\)](#). 2003;81(11):42-6.

[Leshchinskii LA](#), [Mul'tanovskii BL](#), [Ponomarev SB](#), [Petrov AG](#).

Doppler M-mode echocardiography was made in 156 males with ischemic heart disease (IHD) verified coronarographically. The patients were normotensive or had mild, moderate and severe arterial hypertension (AH) (groups 1, 2, 3 and 4, respectively). The groups were similar by functional anginal class. Echocardiographic findings were in many cases similar. This supports the hypothesis that IHD and AH are closely related. However, the addition of AH to atherosclerotic affection of the coronary artery or atherosclerosis rise in the presence of AH is associated with development of myocardial hypertrophy which is registered at echocardiography and correlates in severity with severity of AH. Myocardial hypertrophy is, on the one side, compensatory as it prevents dilation of the left ventricle and impairment of its contractility rising at later stage of the disease with depletion of the myocardial and coronary reserves, but, on the other side, it promotes diastolic dysfunction of the left ventricle, lowers its performance. The above phenomena are most pronounced in combination of IHD with severe AH. This combination presents a new qualitative state and, therefore, needs new approaches to its correction. PMID: 14689710 [PubMed - indexed for MEDLINE]

**[Comparative study of the level of cardiomyocyte hypertrophy in patients suffering from ischemic heart disease with normal arterial pressure and in hypertension]**

[Selivanova GV](#), [Vlasova TD](#), [Moiseeva OM](#), [Krutikov AN](#), [Gordeev ML](#), [Khirmanov VN](#). [Tsitologija](#). 1997;39(10):938-45.

Institute of Cytology, Russian Academy of Sciences, St Petersburg.

A study was performed on the human atrial myocytes, isolated by means of alkaline dissociation of bioplates, obtained in clinics during open heart surgery, from two groups of patients. The first group consisted of 8 men aged from 40 to 62 years, with ischemic heart disease and normal arterial blood pressure. The second group involved 10 men, aged from 43 to 67 years, with ischemic heart disease and arterial hypertension. The nuclear DNA and the total protein in the cytoplasm of isolated cardiomyocytes were revealed by means of the two consecutive tests: the Feulgen and Naphthol yellow S staining. DNA and protein contents were determined by two wave-length scanning cytophotometry. It is ascertained that the temperate arterial hypertension exerted no appreciable influence on the polyploidy level of atrial myocytes, which correlated with the age of patient; in both groups (coefficients 0.7 and 0.4 for the first and second groups, resp.). The myocyte areas correlate with their ploidy



(coefficients--0.7 and 0.7, accordingly). The protein contents in myocytes also correlate with their ploidy (0.5 and 0.7). The average protein content in myocytes of patients in the second group is higher than in the first group, the difference is most distinct when calculating the protein quantity per 2c-genome (717 +/- 34 a. u. and 517 +/- 51 a. u., resp.). A comparison of cytochemical and morphometric indices with some clinical findings obtained by means of echocardiography allowed to reveal the presence of correlative connections among them. The protein contents in myocytes correlate with the left ventricle mass (coefficients 0.6 and 0.5 for the first and second groups, resp.). The correlation between the rate of transmitral blood flow and myocyte ploidy (0.8 and 0.9), and the correlation between the myocyte area and the rate of transmitral blood flow (0.8 and 0.8) look convincing.

PMID: 9505341 [PubMed - indexed for MEDLINE]

**] [Metabolic determinants of efficacy of infrared laser therapy in hypertensive patients with combined pathology]** [Vopr Kurortol Fizioter Lech Fiz Kult.](#) 2005 May-Jun;(3):13-7

[Krysiuk OB](#), [Ponomarenko GN](#), [Obrezan AG](#), [Kostin NA](#).

By a distinct pathogenetic direction of a therapeutic action of laser therapy (LT) on different regulators of blood pressure (BP) and metabolism, 109 patients with essential hypertension (EH) and atherosclerosis and/or diabetes mellitus were studied for LT efficacy depending on metabolic disorders. LT demonstrated metabolic neutrality and inefficacy in patients with multiple marked disorders of fat metabolism and hyperglycemia. Metabolic factors determining LT efficacy comprise hypercholesterinemia, hypertriglyceridemia and hyperglycemia. The factorial analysis points to essential factor restructuring in metabolic disorders. The obtained equation of multiple regression allows prognostication of the degree of a fall of mean BP in response to LT depending on the degree of metabolic disorders.

Publication Types: [Clinical Trial](#) PMID: 16060275 [PubMed - indexed for MEDLINE]

**[The influence of low-intensive laser therapy on the aggregation properties of thrombocytes in patients with peptic ulcer]** [Klin Med \(Mosk\).](#) 2006;84(2):61-4.

[No authors listed]

The purpose of the study was to evaluate the influence of low-intensive laser therapy (LILT) on the aggregation properties of thrombocytes in patients with exacerbation of peptic ulcer (PU). The subjects, 111 patients aged 18 to 63, were divided into two groups: the main group (n = 81), and the control group (n = 30). In addition there were 15 healthy people who also underwent examination. Patients in the main group received complex treatment with antiulcer drugs and different methods of laser therapy: intravenous laser irradiation of blood, cutaneous irradiation, and a combination of both. The



control group was treated with drugs only. The study found various changes in the aggregation properties of thrombocytes in patients with PU exacerbation, which consisted mostly in hyperaggregation. LILT had a normalizing effect on the aggregation properties of thrombocytes in patients of the main group. PMID: 16613009 [PubMed - in process]

**[Intravenous blood laser irradiation in patients with chronic nonspecific lung diseases and bronchial epithelial dysplasia]** [Klin Med \(Mosk\)](#). 2004;82(5):39-41

[Cheremisina OV](#), [Pankova OV](#).

The study included patients with chronic nonspecific lung diseases (CNLD) and a morphologically verified diagnosis of first-second degree bronchial epithelial dysplasia (BED). Forty-six patients underwent intravenous blood laser irradiation (IBLI) (a study group); 45 patients received routine anti-inflammatory therapy (a control group). After therapy in the study group, the clinical and endoscopic signs of an inflammatory process were eliminated in 80.4 and 78.2% of cases, respectively. With morphological monitoring, a full and partial regression of BED occurred in 63.1 and 17.4%, respectively. In the control group, clinical and endoscopic improvements were achieved in 53.3 and 52.0% of cases. Dysplastic changes could be arrested only in 8.9% of cases. The differences were statistically significant ( $p < 0.05$ ). Thus, IBLI is a highly effective treatment of dysplastic bronchial epithelial changes in patients with CNLD as compared with the controls.

**[Therapeutic efficiency of a combined use of low-intensity laser radiation and actovegin in gastroduodenal ulcers with inhibited cicatrix formation]**

[Vakhrushev IaM](#), [Shkatova Elu](#), [Ter Arkh](#). 2003;75(9):86-9.

AIM: To validate use of intravenous laser blood irradiation (ILBI) combined with actovegin administration in indolent gastroduodenal ulcers. MATERIAL AND METHODS: Modern endoscopic, morphological, device, biochemical techniques and radioimmunoassay were used in examination of 92 patients with indolent gastroduodenal ulcers aged 24 to 69 years. ILBI plus actovegin was given in failure of standard medicinal therapy. RESULTS: ILBI plus actovegin combination produced marked analgetic, anti-inflammatory and detoxication effects. Favourable trends were observed in the composition of gastric mucus, detoxication, reparative and metabolic processes in the gastroduodenal mucosa, neurohumoral regulation. CONCLUSION: Combination of ILBI with actovegin proved highly effective in indolent gastroduodenal ulcers.

Publication Types: [Clinical Trial](#) PMID: 14582442 [PubMed - indexed for MEDLINE]



**Laser modification of the blood in vitro and in vivo in patients with Parkinson's disease.** [Bull Exp Biol Med.](#) 2003 May;135(5):430-2. [Vitreshchak TV](#), [Mikhailov VV](#), [Piradov MA](#), [Poleshchuk VV](#), [Stvolinskii SL](#), [Boldyrev AA](#).

Institute of Neurology of the Russian Academy of Medical Sciences, Moscow.

The effect of He-Ne laser radiation on activity of MAO B, Cu/Zn-SOD, Mn-SOD, and catalase in blood cells from patients with Parkinson's disease was studied in vivo and in vitro. The effects of intravenous in vivo irradiation (intravenous laser therapy) were more pronounced than those observed in similar in vitro experiments. It is concluded that generalized effect of laser therapy involves interaction between blood cells. PMID: 12910278 [PubMed - indexed for MEDLINE]

**[Diagnostic implications of changed red cell count in low-intensity laser radiation of blood in elderly patients with coronary heart disease]** [Klin Med \(Mosk\).](#) 2002;80(4):31-3 [Simonenko VB](#), [Siuch NI](#), [Vokuev IA](#).

Intravenous laser therapy in combination with medication was conducted in 41 elderly patients with coronary heart disease (633 nm, 1 mW, 124 mW/cm<sup>2</sup>). The study of qualitative and quantitative (osmotic resistance) erythrocyte indices of blood demonstrated the change of erythrocyte number in circulating blood by the third laser procedure. Frequency of these changes correlated with duration of the treatment course. Intravenous laser therapy had a wider spectrum of effects on erythrocyte number than medication. Changes in erythrocyte number in the peripheral blood upon intravenous laser radiation reflects efficiency of treatment of coronary heart disease patients.

PMID: 12043259 [PubMed - indexed for MEDLINE]

**[Comparative effectiveness of different methods of quantum hemotherapy in the treatment of juvenile diabetic retinopathy]** [Vestn Oftalmol.](#) 2001 Sep-Oct;117(5):11-4. [Nedzvetskaia OV](#).

Effects of ultraviolet exposure of the blood (UVEB), intravenous laser exposure of the blood (IVLEB), and transcutaneous magnetic laser exposure of the blood (TMLEB) on ocular functions, microcirculation, and hemodynamics were studied in 79 patients with juvenile diabetic retinopathy. All these treatments had a nonspecific positive effect on the spatial contrast sensitivity, microcirculation, and choroid hemodynamics of the eye. Correcting mainly intravascular changes in the microcirculatory bed, quantum hemotherapy methods are pathogenetically justified in the treatment and prevention of tissue ischemia in diabetic involvement of the organ of vision. Results of noninvasive TMLEB with generalized and local effects were statistically similar to results of invasive UVEB and IVLEB.

PMID: 11765457 [PubMed - indexed for MEDLINE]



### **[Changes in blood rheological properties in patients with hypertension]**

[Shabanov VA](#), [Terekhina EV](#), [Kostrov VA](#). *Ter Arkh.* 2001;73(10):70-3.

AIM: To study hemorheology in patients with essential hypertension (EH), to improve EH treatment in terms of blood rheology. MATERIAL AND METHODS: Blood rheology, microcirculation, lipid plasm spectrum, central hemodynamics were studied in 90 patients with mild and 83 patients with moderate or severe EH as well as 30 healthy controls before and after treatment (hypotensive drugs, essential phospholipids, intravenous laser blood radiation, plasmapheresis). RESULTS: Hemorrhological disorders (subnormal deformability of the red cells and elastoviscosity of their membranes, disk-spherical transformation and hyperaggregation of blood cells, high dynamic viscosity) correlated with the disease severity, arterial pressure and total peripheral vascular resistance. Long-term (1-1.5 years) hypotensive therapy, especially with combination of beta-blockers with diuretics, has a negative effect on blood rheology. Optimisation of EH treatment in terms of blood rheology consists in using essential phospholipids in stable hypertension, intravenous laser radiation in complicated hypertension, plasmapheresis in drug-resistant hypertension. Such an approach not only significantly improves hemorheology but also provides good clinical and hypotensive effects in 75-80% patients. CONCLUSION: Blood viscodynamics should be taken into consideration in individual treatment of hypertensive patients.

Publication Types: [Clinical Trial](#) PMID: 11763523 [PubMed - indexed for MEDLINE]

### **[Evaluation of clinical effectiveness of intravenous laser irradiation of blood, plasmapheresis and their combination in patients with bronchial asthma]**

[Ishina TI](#), [Kakhnovskii IM](#), [Makarova OV](#), [Solomatin AS](#), [Alekseeva ME](#). *Ter Arkh.* 2001;73(3):15-9.

AIM: To compare clinical response to intravenous laser radiation of blood (ILRB), plasmapheresis (PA) and ILRB + PA in patients with bronchial asthma (BA). MATERIALS AND METHODS: 122 patients with endogenic BA of moderate severity were divided into four groups: group 1 was exposed to ILRB, group 2--to PA, group 3--to ILRB + PA, group 4 received only chemotherapy. The effect was assessed by body plethysmography, peak flowmetry, NBT-test, LCP-test. RESULTS: Patients of group 1-3 vs group 4 demonstrated earlier disappearance of cough and normalization of lung auscultative picture, lower demand of oral glucocorticosteroids, 2 times longer remission, better external respiration function, earlier normalization of peak expiration flow. ILRB, PA and ILRB + PA activate function of oxygen-dependent bactericidal system of blood neutrophils and inhibited activity of non-oxygen-dependent system. CONCLUSION: Combined treatment of moderate severity BA with ILRB, PA alone and in combination is more effective than conventional drug therapy, the highest effect by remission terms being achieved in combination of ILRB with PA.

Publication Types: [Evaluation Studies](#) PMID: 11417173 [PubMed - indexed for MEDLINE]



**[Use of sodium hypochlorite and intravascular laser irradiation of blood in complex treatment of emergency surgical patients]** [Vestn Khir Im I I Grek](#). 2001;160(1):89-91.  
[Tarasenko SV](#), [Pashkin KP](#), [Kopeikin AA](#), [Petiushkin VN](#).

Results of treatment of 50 patients with urgent pathology of organs of the abdominal cavity are presented. Indirect electro-chemical detoxication of blood against the background of the antioxidant protection of organism was applied with the purpose of detoxication. The problems of a possible side effect of the indirect electro-chemical detoxication of blood, the optimum dosage of sodium hypochlorite in the intravenous injection were investigated.

PMID: 11258334 [PubMed - indexed for MEDLINE]

**[Therapy of patients with chronic pancreatitis of alcoholic etiology by dalargin and laser therapy of the blood]** [Klin Med \(Mosk\)](#). 2000;78(12):43-6 [Bulychev VE](#), [Vakhrushev IaM](#).

Effectiveness of dalargin and intravenous laser blood beaming (ILBB) in combined treatment of chronic alcoholic pancreatitis (CAP) was studied in 105 patients (8 females and 97 males) with CAP duration 1 to 25 years. Pancreatic function and treatment effects were studied by routine clinical investigations, advanced laboratory, biochemical tests, radioimmunoassays. Pancreatic disorders in alcoholics present with high blood levels of trypsin and lipase, low levels of insulin and C-peptide. Serum concentrations of hydrocortisone and gastrin were elevated. Combined treatment of CAP with adjuvant dalargin and ILBB not only relieves clinical symptoms but also promotes normalization of pancreatic function.

Publication Types: [Clinical Trial](#) PMID: 11210353 [PubMed - indexed for MEDLINE]

**[Effect of the intravenous laser blood irradiation on efficacy of drug preparation**

[Spasov AA](#), [Nedogoda VV](#), [Konan K](#), [Kucheriavenko AF](#). [Eksp Klin Farmakol](#). 2000 Sep-Oct;63(5):65-7.

Department of Pharmacology, Volgograd State Medical Academy, Ministry of Public Health of the Russian Federation, Russia.

The effect of the intravenous laser blood (ELB) treatment on the sensitivity of blood components with respect to drugs was studied in patients with nonspecific reactive hepatitis and chronic hepatitis. An ELB course reduced the functional activity of thrombocytes in the presence of fibrinogen and adrenaline hydrochloride (collagen inductors), which must be taken into account when these drugs are used as hemostatic agents.

Publication Types: [Clinical Trial](#) PMID: 11109533 [PubMed - indexed for MEDLINE]





**[The effect of intravenous laser irradiation of the blood on the brain bioelectrical activity in patients in the postcomatose period]** [Vopr Kurortol Fizioter Lech Fiz Kult.](#) 2000 Mar-Apr;(2):28-31 [Ildrisova LT](#), [Enikeev DA](#), [Vasil'eva TV](#).

The article presents clinical data on therapeutic effects of intravenous laser blood irradiation (BI) in severe alcohol intoxication complicated by alcohol coma. BI effectiveness was assessed by EEG changes within 3 postcomatose days. Changes in brain biopotentials in various postcomatose periods were unidirectional. Positive results were achieved after low-intensity laser radiation.

PMID: 11094892 [PubMed - indexed for MEDLINE]

**[Cytological parameters of bronchoalveolar lavage in patients with chronic obstructive bronchitis exposed to laser radiation of blood]**

[Ananchenko VG](#), [Khanin AG](#), [Gostishcheva OV](#). [Ter Arkh.](#) 1999;71(11):65-7.

AIM: Clinicocytological evaluation of efficacy of combined treatment of chronic obstructive bronchitis (COB) in exacerbation with application of laser radiation of blood. MATERIALS AND METHODS: Combined treatment with the use of He-Ne intravenous and transcutaneous radiation of blood was given to 32 patients with COB. 27 COB patients treated without blood irradiation served control. Mean age of the patients (39 males and 20 females) was 59 +/- 9.5 years. In addition to conventional methods of examination and control of the treatment effect, cytological and bacteriological tests of BAL precipitate smears were made. RESULTS: Combined COB treatment with the use of laser blood radiation has an antiinflammatory action, promotes normalization of mucociliary transport, activation of phagocytosis and immune defense, cleansing of bronchial tree, reduction of obstruction (by FEV per 1 s), effective management of exacerbations. Hospital stay decreased by 3-4 days. Blood irradiation has the advantages as a noninvasive method. CONCLUSION: Clinical, cytological and bacteriological tests, determination of FEV provide a significant assessment of treatment efficacy in dynamics and facilitate the choice of the most effective regimen for management of COB in exacerbation.

PMID: 10626342 [PubMed - indexed for MEDLINE]

**[The possibility of immunocorrection in spinal-spinal cord trauma by using intravenous laser irradiation]** [Zh Vopr Neurokhir Im N N Burdenko.](#) 1999 Jan-Mar;(1):20-5. [Stupak VV](#), [Rodiukova EN](#).

The natural defense factors of the body and the cell factors of immunity were studied in 60 patients with acute and early spinal trauma. Immunodeficiency develops in 100% of cases with acute and early spinal trauma. Blood intravenous laser radiation at wave lengths of 632 and 830 nm was shown to produce an immunostimulating effect. PMID: 10335572 [PubMed - indexed for MEDLINE]



**[Heparin inhalations combined with intravenous laser exposure of blood in patients with diabetic retinopathy]** [Vestn Oftalmol.](#) 1999 Jan-Feb;115(1):16-8.

[Balashova LM](#), [Teplinskaia LE](#), [Zaitseva NS](#), [Efimov VS](#), [Grishin VL](#), [Bibilashvili RSh](#), [Belogurov AA](#).

Heparin inhalations combined with intravenous laser exposure of the blood are effective in patients with nonproliferative, preproliferative, and proliferative diabetic retinopathy. Clinical effect consisted in decrease of edema in the macular area, partial resolution of hemorrhages, a tendency to decrease in the caliber of veins, improvement of visual acuity, and extension of visual field. Immunological studies revealed immunomodulating effect of heparin inhalations and intravenous laser exposure of the blood, manifesting by decreased levels of pathological circulating immune complexes and increased concentrations of immunoglobulins, mainly IgG and IgM. Diabetic hemophthalmia is to be treated by subtenon implantation of a collagen system with injection of a prourokinase thrombolytic in combination with preoperative preparation including heparin inhalations, intravenous laser exposure of the blood, and parabolbar administration of 0.5 ml 1% emoxipin for 5 days in order to normalize immune hemostatic and redox processes and create conditions for effective action of the thrombolytic. PMID: 10207313 [PubMed - indexed for MEDLINE]

**[Endovascular laser irradiation of blood in the comprehensive treatment of stomach cancer]** [Vopr Onkol.](#) 1998;44(6):704-7. [Kamarli ZP](#), [Ankudinova SA](#), [Kolesnikova RN](#).

Kirghiz-Russian (Slavic) University, Bishkek, Kirghizstan.

The data on the treatment of 35 patients with gastric cancer (two groups) are presented. In group I, surgery and chemotherapy were given; in group II--intravenous helium-neon laser therapy as a component of complex treatment. Dynamic changes in hematological and immunological indices were investigated. The immunological and hemopoietic indices improved after laser therapy.

PMID: 10087969 [PubMed - indexed for MEDLINE]

**[Heparin inhalations and laser exposure of blood in treatment of patients with open-angle glaucoma]** [Vestn Oftalmol.](#) 1998 Nov-Dec;114(6):6-9.

[Balashova LM](#), [Listopadova NA](#), [Zaitseva NS](#), [Teplinskaia LE](#), [Efimov VS](#), [Grishin VL](#), [Kantarzhi EP](#).

Comparative assessment of methods aimed at amelioration of the immunohemostatic processes in patients with open-angle glaucoma suffering from chronic vascular diseases showed that the most remarkable improvement of the visual functions and decrease of the level of circulating immune complexes in the blood were attained in the patients treated by heparin inhalations combined with intravenous laser exposure of the blood as against patients treated by one of these methods alone or traditionally. PMID: 9951375 [PubMed - indexed for MEDLINE]



**[A quantitative analysis of the ultrastructures of the blood polymorphonuclear neutrophils in patients with ischemic heart disease after a session of intravenous laser therapy]** [Arkh Patol.](#) 1998 Nov-Dec;60(6):24-6. [Khomeriki SG](#), [Morozov IA](#).

Pushchino Medical Centre.

Circulating neutrophilic granulocytes before and after laser therapy were studied in 10 patients with ischemic heart disease and 5 healthy persons. The patients had severe cytoplasm vacuolization, specific granules number increase, a decrease in thickness of the submembranous actin layer and decrease of surface = volume ratio. Neutrophils indices in patients with ischemic heart disease become closer to those in donor cells after blood irradiation with a helium-neon laser. The results indicate a normalizing effect of helium-neon laser irradiation on the mechanisms of non-specific reactivity in some forms of ischemic heart disease. PMID: 9949900 [PubMed - indexed for MEDLINE]

**[The effect of the laser irradiation of the blood on its lipid and phospholipid components in diabetes mellitus]** [Voen Med Zh.](#) 1998 Oct;319(10):37-8, 95

[Lebed'kov EV](#), [Tolstykh PI](#), [Marchenko LF](#), [Turkina TI](#), [Krivikhin VT](#).

Study results of the laser irradiation impact on the blood lipid and phospholipid components and membrane erythrocyte in patients with diabetes mellitus and pyo-necrotic injuries of lower extremities when treated by laser intravenously or epicutaneously. The results prove, that the laser irradiation of low intensity favourably affects the blood components in a complex treatment of diabetes mellitus. Intravenous irradiation positive dynamics are more easily

**[The effect of endovascular helium-neon laser therapy on the immune status of patients with acute calculous pyelonephritis]** [Urol Nefrol \(Mosk\).](#) 1996 Nov-Dec;(6):9-11.

[Siniukhin VN](#), [Janenko EK](#), [Safanov RM](#), [Khamaganova EG](#), [Borisik VI](#).

Cellular immunity was assessed in 48 patients with acute calculous pyelonephritis exposed to intravenous He-Ne laser therapy. It was found that endovascular He-Ne laser therapy in the study regimens corrects immunological abnormalities arising in acute calculous pyelonephritis.

PMID: 9036617 [PubMed - indexed for MEDLINE] observed.



**[Intravenous laser irradiation of the blood at the health-resort stage of treatment for bronchial asthma patients]** [Vopr Kurortol Fizioter Lech Fiz Kult.](#) 1996 Sep-Oct;(5):9-12

[Iusupalieva MM](#), [Shatrov AA](#), [Grabil'tseva TA](#).

The efficiency of spa treatment in combination with intravenous He-Ne laser (wavelength 0.63 microns) radiation of the blood was studied in 152 patients with bronchial asthma of endogenous genesis, mainly with that of moderate severity. By the end of 24-day treatment there were clinical improvements, better external respiratory parameters, and alleviated inflammation.

PMID: 9036676 [PubMed - indexed for MEDLINE]

**[The intravenous laser therapy of circulatory encephalopathy]**

[Shapovalov VM](#), [Podvigin AV](#), [Opekunova GT](#), [Storokha AA](#). [Voen Med Zh.](#) 1996 Apr;317(4):30-1.

PMID: 8754056 [PubMed - indexed for MEDLINE]

**[Laser therapy in the treatment of patients with ischemic heart disease in a therapeutic department]** [Aviakosm Ekolog Med.](#) 1996;30(3):57-8 [Kondrakov VM](#), [Chuntul VV](#), [Derkach AV](#), [Bobyrev IuA](#), [Khmelevskaia TB](#).

Influence of the intravenous (a 30-min exposure) laser therapy with the use of apparatus AFL-2 (8-12 sessions) on patients suffering from the ischemic heart disease of different functional categories has been studied. Blood viscosity and lipoproteins were measured in 48 patients. Positive effect of the treatment was determined from decreased number of daily attacks of angina and reduction of nitroglycerine tablets uptake by 50% and more ("good"), by 30-50% ("adequate") and less than 30% ("inadequate"). "Good" or "adequate" clinical effects were noted in 91% of the patients. Most probably, the positive effect is linked with improvement in rheologic blood properties.

PMID: 8963300 [PubMed - indexed for MEDLINE]

**[The effect of different types of laser therapy on the reactivity of the peripheral blood neutrophils in patients with ischemic heart disease]** [Vopr Kurortol Fizioter Lech Fiz Kult.](#) 1995 Jan-Feb;(1):5-7.

The responses to laser therapy (intravenous, continuous skin exposure without a magnet, magnetic laser therapy) of 83 patients with coronary heart disease aged 50-80 demonstrated the advantages of noninvasive laser irradiation of blood. Myeloperoxidase activity may serve a criterion for estimating the number of irradiation procedures needed. [Siuch NI](#), [Illarionov VE](#).

PMID: 7785229 [PubMed - indexed for MEDLINE]



### **[Intravenous laser irradiation of blood and oxygen transport function]**

[Anesteziol Reanimatol.](#) 1995 Jan-Feb;(1):42-3 [Kozhekin VV](#), [Reshel'ko OA](#), [Tkachev AM](#), [Zhuk SA](#).

The oxygen-transporting function of the blood was assessed in children with acute respiratory failure before and after laser irradiation of the blood. The microcirculatory component of transport was assessed by transcutaneous oxygen monitoring using functional tests, the hemic component by assessment of the gaseous composition of arterial blood and estimation of oxygenation algorithm. Four variants of tissue hypoxia were revealed in the examinees. Laser exposure had a good effect on the mechanisms leading to two types of hypoxia, hypoxic and ischemic.

PMID: 7605036 [PubMed - indexed for MEDLINE]

### **[Intravasal laser irradiation of autologous blood in the treatment of eye diseases]**

[Eliseeva EV](#), [Shusterov IuA](#), [Vakhrushev BN](#). [Vestn Oftalmol.](#) 1994 Apr-Jun;110(2):23-4

Treatment of central nonexudative chorioretinal dystrophies, vascular opticopathies, keratitis and uveitis associated with disorders of immunity status is a pressing problem of ophthalmology. Intravascular laser exposure of the blood was used for the treatment of these conditions. ALOK-1 device for low-energy He-Ne intravenous irradiation of the blood was used. The authors analyze the results attained in 15 patients (24 eyes) with central nonexudative chorioretinal dystrophies and vascular opticopathies (group 1) and in 16 ones (20 eyes) with chronic relapsing keratitis and uveitis (group 2). A positive effect was attained in all the cases, manifesting in group 1 in improvement of vision acuity, widening of visual field, normalization of electrophysiological parameters and in group 2 in improvement of vision acuity, rapid resorption of corneal precipitate, reduced injection of the eyeball and opacities in the vitreous body, a more rapid corneal epithelialization, and normalization of blood and lacrimal immunograms. The attained effect may be explained by a complex neurotrophic and immunomodulating effect of laser. The method is sufficiently effective and simple, this permitting its use on an outpatient basis.

### **[The magneto-, photo- and laser therapy of headaches in patients with vascular brain lesions]**

[Zh Nevropatol Psikhiatr Im S S Korsakova.](#) 1994;94(5):15-8.

[Troshin VD](#), [Miasnikov IG](#), [Belousova TE](#).

To manage vascular cephalalgia, a combined approach is proposed: segmentally oriented magnetic, photo- and photomagnetic therapy plus intravenous laser treatment. The effect was directly correlated with cerebral hemodynamic condition, damage to vegetative innervation segmental-peripheral link and physiotherapeutic factors. PMID: 7900442 [PubMed - indexed for MEDLINE]



**[Use of low intensity laser irradiation in the treatment of thrombophlebitic complications during subclavian vein catheterization]** [Anesteziol Reanimatol.](#) 1993 Nov-Dec;(6):66-8 [Shishkin SA.](#)

A total of 1050 subclavian catheterizations have been performed in an intensive care unit, thrombophlebitic complications have been clinically diagnosed in 22 patients (2.1%), 3 patients developed signs of chronic venous failure long after the procedure. Intravascular laser blood irradiation (IVLBI) reduced hypercoagulation, increased fibrinolytic activity, improved blood viscosity, stimulated collateral blood flow, etc. That is why IVLBI was used in a complex of therapeutic procedures in 7 patients with thrombophlebitic complications upon subclavian catheterization. In 1 patient IVLBI was used in combination with intravenous sodium hypochlorite administration. The course of IVLBI consisted of 5-7 procedures, the power of irradiation at the end of the light probe was 5-6 mWt. The level of medium mass molecules, leukocyte index of intoxication, hematological index of intoxication, coagulogram parameters have been assessed; contrast phlebography was performed in patients with phlebothrombosis before and after IVLBI. There were no signs of chronic venous failure in this group of patients long after the procedure. The author comes to the conclusion that the use of low intensity laser irradiation and intravenous administration of sodium hypochlorite improve the effect of therapy in postcatheterization thrombophlebitic complications.

Publication Types: [Case Reports](#) PMID: 8185080 [PubMed - indexed for MEDLINE]

**[Mechanisms of action of intravenous helium-neon laser irradiation in anesthesia]**

[Avrutskii Mla](#), [Azizov IuM](#), [Musikhin LV](#), [Guseinov Tlu](#), [Koloskov VV](#). [Anesteziol Reanimatol.](#) 1993 Sep-Oct;(5):43-5

Intravenous exposure to He-Ne laser was added to the anesthesiologic schemes of 26 patients during surgery on the intestine. The reference group consisted on 23 patients. Comparison of the blood antioxidant activities (from the levels of ceruloplasmin and transferrin) and the endogenous intoxication levels (from the medium molecule test) showed that intravenous laser exposure at a wavelength of 630 nm stabilized the blood antioxidant activity and prevented the development of endogenous intoxication. PMID: 8116900 [PubMed - indexed for MEDLINE]

**[The effect of the blood serum from patients subjected to intravenous laser therapy on the parameters of synaptic transmission]** [Biull Eksp Biol Med.](#) 1993

Aug;116(8):149-51. [Azbel' DI](#), [Egorushkina NV](#), [Kuznetsova Ilu](#), [Ratushniak AS](#), [Shergin SM](#), [Shurgaia AM](#), [Shtark MB](#).

The effect of serum of patients with myocardial ischemia after low-level laser therapy on parameters of synaptic conductance of rat hippocampal neurons was investigated. The serum from patients with an initially low level of neuronal activity obtained after determination of laser irradiation increased the amplitude and that from patients with high activity. Thus the process of normalization of these





parameters was observed. Our results may help to optimize the course of medical treatment, and subsequently give an insight to understanding of the mechanism of therapeutic effect of laser irradiation.

PMID: 8274685 [PubMed - indexed for MEDLINE]

**[The immunological indices of patients with acute pyelonephritis combined with acute salpingo-oophoritis undergoing intravenous and local laser irradiation]**

[Kozlov VA](#), [Makarov OV](#), [Slastnikova EB](#), [Samuilova DSh](#), [Savchenko TN](#). *Urol Nefrol (Mosk)*. 1993 Jul-Aug;(4):2-5. PMID: 8310559 [PubMed - indexed for MEDLINE]

**Application of intravenous low-intensity laser irradiation as part of anesthetic care during invasive surgery.** *J Clin Laser Med Surg*. 1992 Aug;10(4):291-5.

[Avrutsky MJ](#), [Katkovsky DG](#), [Guseinov TJ](#), [Musichin LV](#), [Finkelstein IE](#). Institute for Laser Surgery, Moscow, Russia.

The aim of this study was to evaluate the possibility of applying low-intensity He-Ne laser irradiation as part of a complex system of anesthetic care of patients during invasive surgery. The following technique of intravenous low-intensity laser irradiation (i.v. LILI) was used. A filament of He-Ne laser was introduced through the subclavian venous line into the ostium of the vena cava superior. The power output was 20 mV, the exposure period 30 minutes. The irradiation began 10-15 minutes before anesthesia was introduced. In some cases, a second session was required. The 61 patients enrolled in the study were divided into a study group of patients who were irradiated and into a control group of patients who did not receive i.v. LILI. It was shown that i.v. LILI decreases neuroautonomous strain on the patient. Under the influence of i.v. LILI the P 50 appears to increase, the index of tissue oxygen extraction does not change, and the data of the acid base balance tend to improve. Low plasma levels of 11 oxycorticosteroids and the plasma content of 5-HTA and histamine as well as moderate changes in plasma enzyme activity confirm the efficacy of protecting patients from surgical trauma by application of i.v. LILI.

PMID: 10147879 [PubMed - indexed for MEDLINE]

**[The effect of transvenous laser therapy on lipid peroxidation function in patients with ischemic heart disease]** *Kardiologiia*. 1992 Jul;32(7-8):43-5.

[Vakhliaev VD](#), [Smirnova IE](#), [Uchaikina LV](#), [Barsel' VA](#), [Aksiutina MS](#), [Matveeva SA](#), [Paramonova MA](#), [Shchedrina IS](#), [Syrkin AL](#).

The papers deals with changes in the levels of lipid peroxidation products in patients with stable angina of effort, which occurred with intravenous helium-neon blood irradiation. The therapy was highly effective in patients with lower functional classes and persons with normal circulation, resulting in a reduction in lipid peroxidation intensity. Predictors are recommended to determine the efficiency and expediency of laser therapy in patients with coronary heart disease.

PMID: 1487878 [PubMed - indexed for MEDLINE]



**[Intravenous laser irradiation of the blood in severe forms of chronic venous insufficiency]** [Vestn Khir Im I I Grek](#). 1992 Jul-Aug;149(7-8):78-80.

[Shval'b PG](#), [Kachinskii AE](#), [Kolobaev VI](#), [Kataev MI](#).

Based on an analysis of results of treatment of 86 patients the authors have shown that the intravenous laser irradiation of blood results in hypocoagulation, lower hematocrit index. In 52 patients good results of treatment were obtained, in 26 patients results were satisfactory. No complications were noted.

PMID: 1341374 [PubMed - indexed for MEDLINE]

**Noninvasive laser-based blood pressure measurement in rabbits.**

[Herrold EM](#), [Goldweit RS](#), [Carter JN](#), [Zuccotti G](#), [Borer JS](#). [Am J Hypertens](#). 1992 Mar;5(3):197-202

Division of Cardiology, New York Hospital-Cornell Medical Center, NY 10021.

To obtain serial blood pressure measurements without trauma in rabbits, we developed a laser-based method which permits noninvasive determination of systolic and diastolic arterial blood pressure. The ease and accuracy of this method were evaluated over a range of blood pressures in five New Zealand White rabbits. Laser-based pressures from the central ear artery were compared with cannula-based pressures from the contralateral central ear artery. Pressures were measured before and during infusions of saline (control), nitroprusside, or epinephrine, and following induction of anesthesia. Noninvasive measurements correlated highly with direct measurements (systole:  $r = 0.89$ ; diastole:  $r = 0.93$ ). The difference between the non-invasive and direct pressure measurements during saline, nitroprusside, and epinephrine infusions, and following anesthesia, respectively, were (mean  $\pm$  SD, systole/diastole):  $4.2 \pm 2.4$  ( $P = \text{NS}$ )/ $9.3 \pm 1.4$  ( $P$  less than .001),  $4.1 \pm 1.6$  ( $P$  less than .02)/ $3.2 \pm 1.1$  ( $P$  less than .01),  $0.6 \pm 2.4$  ( $P = \text{NS}$ )/ $-3.0 \pm 2.7$  ( $P = \text{NS}$ ), and  $-5.1 \pm 2.9$  ( $P = \text{NS}$ )/ $0.3 \pm 1.3$  ( $P = \text{NS}$ ). The noninvasive method did not result in observable agitation of the animals. To optimize results, visual inspection was required to assure that the instrument's diaphragm was not deformed or dried from previous use, and that the diaphragm was placed over the center of the arterial lumen. It was also necessary to dim room lights and to direct heating lights away from the ears to avoid degrading light signal quality. These results, albeit involving a small number of animals, indicate the potential utility of this method in the study of chronic pathophysiological processes requiring long-term repeated determination of systolic and diastolic blood pressure.

PMID: 1575948 [PubMed - indexed for MEDLINE]



## **[The use of helium-neon laser in drug-resistant cardiac arrhythmias]**

[Gel'fgat EB](#), [Abdullaev RF](#), [Babaev ZM](#), [Musabekov SSh](#). [Kardiologiia](#). 1992 Feb;32(2):66-8.

Out of 85 patients with cardiac arrhythmias in the presence of chronic coronary heart disease, 28 who were resistant to ethacisine and allapinine were included into the study. They had frequent and persistent arrhythmias. The patients were divided into 2 groups: (1) the patients receiving intravenous He-Ne laser therapy in combination with one of the above drugs; (n = 17) and (2) those taking He-Ne laser therapy alone (n = 11). The efficacy of the therapies were controlled by 24-hour monitoring. An antiarrhythmic effect was more frequently observed when He-Ne laser was combined with one of the above drugs than when it was given alone (67.4 and 36.3%, respectively).

PMID: 1527940 [PubMed - indexed for MEDLINE]

## **[The state of autonomic homeostasis during the use of a low-intensity helium-neon laser as a component of combined anesthesia]** [Anesteziol Reanimatol](#). 1992 Jan-Feb;(1):17-9

[Avrutskii Mla](#), [Musikhin LV](#), [Finkel'shtein IE](#), [Katkovskii DG](#), [Guseinov Tlu](#).

The effect of intravenous blood irradiation, using helium-neon laser, on vegetative homeostasis during surgery was studied. It has been established that the introduction of low-intensity laser blood irradiation into a complex of anesthesiologic procedures ensures a more effective protection of patients from the surgical stress.

PMID: 1524243 [PubMed - indexed for MEDLINE]

## **[Possibilities of intravenous use of helium-neon laser in the treatment of experimental tuberculosis of animals]** [Probl Tuberk](#). 1992;(5-6):25-7

[Topol'nitskii VG](#), [Maliev BM](#), [Gracheva MP](#), [Kruglova EG](#).

The study presents experimental finding of 40 mongrel dogs whose intravascular blood was irradiated with laser as a supplement to the multimodality treatment of respiratory tuberculosis. Earlier disappearance of intoxication symptoms and reduced terms of destruction cavity decrease and closure, as roentgenologically evidenced, was achieved. The influence of this treatment on certain lipid peroxidation parameters, hemocoagulation, immunity status and bacteriostatic blood activity were found. There were no side effects during treatment.

PMID: 1409508 [PubMed - indexed for MEDLINE]



### **[The use of low-energy lasers for preventing and treating postoperative and radiation-induced complications in patients with head and neck tumors]**

[Kitsmaniuk ZD](#), [DemochkoVB](#), [Popovich VI](#). [Vopr Onkol](#). 1992;38(8):980-6.

The efficacy of low-energy helium-neon and copper vapor lasers for prevention and treatment of postoperative and irradiation complications was assessed in 195 patients with locally advanced tumors of the head and neck. The control group included 118 patients. Intravenous laser irradiation of the blood was associated with a higher percentage of wound healing by first intention and better course of the postoperative period. Laser treatment of skin irradiation fields was shown to improve skin tolerance to the neutron beam. The study failed to establish tumor growth stimulation by the laser irradiation in terms of recurrence and metastasis development. The data obtained showed low-energy laser irradiation to offer promise for prevention and treatment of postoperative and irradiation complications. PMID: 1300810 [PubMed - indexed for MEDLINE]

### **[The effect of helium-neon laser radiation on the energy metabolic indices of the myocardium]** [Biull Eksp Biol Med](#). 1991 Mar;111(3):302-5 [Chizhov GK](#), [Koval'skaia NI](#), [Kozlov VI](#).

It was shown in experiments on white rats, that intravenous and direct myocardium helium-neon laser irradiation leads to the some activation of lactate, glucose-6-phosphate, succinate and reduced NAD dehydrogenases. During direct myocardium irradiation these changes are in a less degree. It is suggested that helium-neon laser irradiation displays some active influence on the energy metabolism enzymes of the myocardium, and the mechanisms of this action are discussed.

PMID: 2054512 [PubMed - indexed for MEDLINE]

### **[The use of intravenous low-intensity laser irradiation of the blood in the total complex of anesthesiological protection of patients against surgical stress]**

[Avrutskii MIa](#), [Katkovskii DG](#), [Musikhin LV](#), [Guseinov TIu](#), [Rozhkov IuI](#), [Galenchik AI](#). [Anesteziol Reanimatol](#). 1991 Mar-Apr;(2):3-6

60 patients, aged 28 to 80 years, hospitalized for surgical treatment of various esophageal, gastric and intestinal diseases have been examined. In 30 patients (group 1) during surgery conventional neuroleptanalgesia was accompanied by intravenous low-intensity laser blood irradiation (ILILBI). The remaining 30 patients formed the control group. Unlike control patients, in patients of group 1 adequate perfusion and tissue oxygenation were maintained throughout the whole period of surgical intervention, general stress reaction to surgical trauma was less pronounced. The data obtained demonstrate the advisability of ILILBI introduction into a complex of anesthesiological protection.

PMID: 1862983 [PubMed - indexed for MEDLINE]



### **[Changes in acid-base equilibrium of blood after intravenous laser irradiation**

**(experimental study)]** [Khirurgija \(Mosk\)](#). 1990 Jun;(6):19-21 [Iudin VA](#), [Morshakova EF](#), [Fedoseev AV](#), [Krokhovina LV](#), [Botov AV](#).

Experiments were conducted to study the acid-base equilibrium of blood in pancreatitis and in combination with laser irradiation of venous blood by the intravascular method through a light guide. Irradiation of blood was attended by inhibition of metabolic acidosis development, which was evidently linked with improved blood oxygen transport function in response to exposure to the laser beam. PMID: 2214568 [PubMed - indexed for MEDLINE]

### **[Combined helium-neon laser therapy in patients with ischemic heart disease]**

[Korochnik IM](#), [Kartelisev AV](#), [Babushkina GV](#), [Kapustina GM](#). [Kardiologija](#). 1990 Mar;30(3):24-8

The paper describes the combined helium-neon-laser (HNL) therapy (intravenous and topical) developed by the authors to treat patients with coronary heart disease. A high efficacy of this therapy mode was demonstrated in patients over 70 years of age with Functional Classes III-IV angina refractory to antianginal agents. The mechanisms responsible for therapeutic efficiency of laser irradiation were studied at the membraneous and cellular levels. There is evidence that the combined HNL-therapy had advantages over topical HNL exposure in terms of higher clinical efficiency and patterns of abnormal chemical changes. PMID: 2381119 [PubMed - indexed for MEDLINE]

### **[The ALOK-1 laser apparatus for intravenous irradiation of the blood (initial experience with its clinical use)]**

[Med Tekh](#). 1990 Jan-Feb;(1):42-3

[Gausman Bla](#), [Zakharchenko Ala](#), [Kataev MI](#), [Larshin AS](#), [Martynov AI](#), [Maiakin LL](#), [Solov'eva LI](#), [Shval'b PG](#).

Intravenous blood radiation with low-intense laser at a wavelength of 0.63 micron activates energy enzymes of red blood cells, ameliorates the rheological blood properties and normalizes lipid peroxidation processes.

PMID: 2338913 [PubMed - indexed for MEDLINE]

### **[Helium-neon laser therapy in the combined treatment of unstable stenocardia]**

[Korochnik IM](#), [Kapustina GM](#), [Babenko EV](#), [Zhuravleva Nlu](#). [Sov Med](#). 1990;(3):12-5.

He-Ne laser therapy included in complex of therapeutic methods for patients with unstable angina pectoris is a highly effective treatment modality; it helps essentially reduce the risk of acute myocardial infarction in these patients. Clinical efficacy of laser therapy is confirmed by its favorable action on hemostasis plasma factors, consisting in reduction of fibrinogen level, normalization of antithrombin-III



(AT-III), decrease of the level of soluble fibrin monomer complexes, this indicating a lowering of the blood coagulation potential. Absence of significant changes in plasminogen level may be an indicator of the nonenzymic route of fibrinogen system activation. Sessions of intravenous laser therapy should be administered 2-3 times a week to unstable angina pectoris patients with low AT-III levels, whereas for patients with initially high or normal AT-III levels combined laser therapy is advisable (4-5 daily invasive procedures and 6-8 skin surface ones on the Zakharyin-Head's zones). Measurements of endogenous anticoagulants is an effective means for monitoring laser therapy in this patient population.

PMID: 1973307 [PubMed - indexed for MEDLINE]

### **[Effect of intravenous laser irradiation of blood on the homeostasis in patients with hemorrhagic pancreatitis]** [Klin Med \(Mosk\)](#). 1989 Aug;67(8):70-3. [Dedenko IK](#).

After intravenous blood exposure to low-intensity radiation of Helium-Neon laser patients with haemorrhagic pancreatitis exhibited inhibition of the blood proteolytic activity; enhancement of free-radical oxidation, kallikrein-kinin system activity, blood oxygen transport, correction of endotoxic pancreatogenic syndrome. In addition, the positive shifts were also observed in the immunological status, morphofunctional characteristics of the red blood cells and hemoglobin, hepatic and renal functions. In severe pancreatogenic endotoxemia the highest response was achieved with combined use of hemosorption and intravenous laser irradiation. PMID: 2811243 [PubMed - indexed for MEDLINE]

### **[Intravenous laser therapy in multimodal treatment of acute pneumonia]** [Sov Med](#). 1989;(7):22-6. [Korochkin IM](#), [Platonova TK](#), [Kapustina GM](#), [Belov AM](#), [Alekseeva OG](#).

Such therapy has been administered to 70 patients with acute pneumonias. 25 patients on traditional therapy have made up the reference group. The effects of laser therapy on the clinical picture, status of the coagulation system cellular and plasma factors, fibrinolysis, and on the blood stream at the site of the pneumonic involvement have been examined in the patients with acute pneumonias in single tests and after a course of treatment. Intravenous laser therapy has had a favourable effect on the clinical course of acute pneumonias, accelerating the terms of pneumonia resolution and promoting an earlier and more complete restoration of the blood stream and normalization of the hemostasis, in contrast to routine therapy. PMID: 2799521 [PubMed - indexed for MEDLINE]

### **[Intravenous use of low-energy helium-neon laser irradiation in unstable angina]** [Ionin AP](#), [Volkova EG](#). [Sov Med](#). 1989;(8):17-9

The effects of low-energy He/Ne laser on some functional characteristics of cardiac activity have been examined in 90 patients with unstable angina pectoris. Altogether 618 sessions of venous blood irradiation have been carried out. A random-sample reference group consisted of 25 patients. Antianginal effect has been assessed by the number of anginal attacks and by the number of daily nitroglycerin tablets. Exercise tolerance has been examined by paired bicycle ergometry; the ventricular





rate activation parameters have been examined by the ECG technique and its first derivative. The data evidence a true antianginal clinical effect of intravenous laser therapy, increase of exercise tolerance in respect of both the total exercise performed and the time increment, and an essential acceleration of the ventricular activation in the patients with unstable angina. Publication Types: [Clinical Trial](#)

**[Effects of intravascular laser irradiation of blood on growth and metastasis of lymphosarcoma in rats]** [Biull Eksp Biol Med.](#) 1988 Oct;106(10):472-3

[Tsukerman Ila](#), [Iaremenko KV](#), [Ibragimova SG](#).

The effect of intravenous blood radiation by low-intensity laser on tumour growth in Wistar rats with Pliss lymphosarcoma has been studied. As a result of single or double blood radiation by laser with wave-length of 510 and 633 nm both the tumour growth inhibition and metastases disappearance have been shown. PMID: 3191241 [PubMed - indexed for MEDLINE]

**[Use of intravenous irradiation by quantum generators in congenital heart defects complicated by septic endocarditis]** [Vestn Khir Im I I Grek.](#) 1986 Sep;137(9):11-4

[Litasova EE](#), [Vel'tmander NN](#), [Karas'kov AM](#), [Novikov AI](#).

The article presents results of examinations of 70 patients with congenital heart diseases with phenomena of secondary septic endocarditis subjected to the intravenous irradiation by quantum generators by the method described. A considerable positive effect of the intravenous laser irradiation on the development of septic endocarditis was confirmed by clinical and laboratory findings. The immunological examination of 8 patients from this group has revealed an immunostimulating effect of the intravenous laser irradiation: elevated concentration of immunoglobulins in blood, increased amount of immune-competent cells. A conclusion is made that the intravenous laser irradiation is an effective method of correction of the immune deficient states in congenital heart diseases.

PMID: 3787958 [PubMed - indexed for MEDLINE]

**[Anti-inflammatory and immunosuppressive effects of laser therapy in patients with rheumatoid arthritis]** [Ter Arkh.](#) 1985;57(8):37-9 [Tupikin GV](#).

The clinical and laboratory findings were examined of 10 patients with seropositive rheumatoid arthritis (RA) treated with a first applied technique of intravenous irradiation of the circulating blood with helium-neon laser combined with external irradiation of the inflamed joints. A distinct antiinflammatory and immunosuppressant effect was attained in all the RA patients. In 80% of the test subjects, the rheumatoid blood factor reduced to 1:20 titres. The treatment method did not cause any side effects or complications and shortened the time of the patients' stay at hospital.

Publication Types: [Case Reports](#) PMID: 4071434 [PubMed - indexed for MEDLINE]

