

History & information on UBI technology in the treatment of various diseases & disease conditions.

This is one of the most informative pieces that you will read on Ultraviolet Blood Irradiation. It is a bit technical but provides insight into this forgotten but great therapy that has been in use in Europe for the last 50 years. Certain elements regarding LUBI (the use of an intravenous laser for UV Irradiation with red light) have been left out and are obtainable in the original at the following web site www.DrsUBI.com. Tom Lowe 517/202-5959

The practice of UBI Therapy began in the 1920s when a UBI device also known as Ultra-Violet Blood Irradiation (UBI) was developed for extracorporeal treatment of the blood. By the 1940s UBI came to be used to treat bacterial, viral, and autoimmune diseases. Researchers came to understand that the central mechanism of the therapy was the secondary emissions of biophotons from blood cells activated by the treatment. But enthusiasm over the new antibiotics and vaccines in the 1950s caused the UBI device to be placed on the shelf even though for certain indications (hepatitis, viral pneumonia) UBI was demonstrably superior.

In the 1970s interest in UBI revived in Russia. At the same time, a new form of UBI Therapy termed "photopheresis", which entailed triggering chemotherapy with a small dose of UBI, was invented in the US. By the 1990s, Russian physicians were using low-intensity lasers beamed down a waveguide directly into the blood (LUBI) Laser UBI Therapy to achieve roughly equivalent effects. The development of multidrug resistance to antibiotics in recent years and the search for less toxic therapies have led to a renewed interest in UBI Therapy. By now, millions of patients have been successfully treated with UBI and scores of clinical trials have been conducted in Russia, Ukraine, and the former East Germany. UBI is also used by some physicians in China and the United States.

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History of UBI

The first person to experiment with this approach was K. Naswitis, who directly treated the blood with UV through a shunt in 1922. Beginning in 1923, Seattle scientist Emmet Knott, D.Sc., sought to harness in an extracorporeal way the known bactericidal property of ultraviolet rays in order to treat infectious diseases of the blood. Knott built an apparatus that would remove blood from the body through a tube, citrate it to avoid coagulation, expose it in a small chamber to calibrated UV, and then pump it through a tube back into the body.

In experiments with dogs, Knott first attempted to treat the entire volume of blood after infecting the dogs so as to induce severe septicemia. He found that the treatment cleared their blood of any trace of infection, but that they all died in 5-7 days of profound depression and a progressive respiratory slow-up and failure. After further experimentation in which the apparatus failed part-way through the experiment but the dog survived without infection, Knott concluded that it sufficed to treat a mere 1-1/2 cc of blood per pound of body weight--about 5 percent of the total volume of blood--and that this dosage had no untoward side effects at all.

Knott's notion of treating the blood with UV to destroy microorganisms was an obvious one; but demonstrating that it could be done in a safe and effective manner as well as devising over years of careful

testing a practical mode for so doing--those constituted a major scientific contribution.

The first treatment of a human occurred in 1928. The patient was a woman moribund following a septic abortion complicated by hemolytic streptococcus septicemia. Treatment with UBI returned her to normal health. Indicative of the caution with which Knott and his medical collaborators worked, there was no further treatment of a human subject until 1933 when the device again cured a patient with advanced hemolytic streptococcus septicemia. The UBI device then began to be used with some frequency on patients with severe septicemia and subsequently on patients with viral pneumonia.

By the 1940s several dozen physicians were regularly using Knott's device according to the technique established by Knott. They treated bacterial infections, pneumonia, poliomyelitis, botulism, non-healing wounds, encephalitis, peritonitis, asthma, pelvic inflammatory disease, biliary disease, hepatitis, and many other infectious, inflammatory, and autoimmune disorders. Surgeons were particularly interested in the use of UBI pre- and post-operationally to treat infections, and The American Journal of Surgery ran many articles on UBI therapy.

In more refractory illnesses, the treatment would be repeated many times over the course of a few weeks, with varying results depending largely on the stage of the disease. In the treatment of tens of thousands of patients, the main side effect observed was a flushing of the skin in many cases.

The results of treatment included: inactivation of toxins, destruction and inhibition of growth of bacteria, increase in the oxygen-combining power of the blood and oxygen transportation to organs, activation of steroid hormones, vasodilation, activation of white blood cells, stimulation of cellular and humoral immunity, stimulation of fibrinolysis, decreased viscosity of blood, improved microcirculation, stimulation of corticosteroid production, and decreased platelet aggregation.

Proponents of UBI published their findings in dozens of scientific articles. Thousands of patients were treated at leading centers like Georgetown University Hospital. UBI fared well in several clinical trials with controls, but most of the published studies consisted of series of cases without controls. One critical study (Moor et al. (1948)) pointed out the lack of controls and the unclear criteria for success in the articles published by UBI's proponents. It also claimed that UBI had no effect on bacteria or toxins. But its own methodology was faulty. The researchers erroneously assumed that it was the direct extracorporeal treatment of the blood that was claimed to destroy great numbers of infectious microorganisms, whereas Knott had discovered that it was the pharmacological action of the activated blood cells upon their return to the body that was the true therapy. Likewise, in a test of UBI's effects against overwhelming infections in rabbits inoculated with botulism, the critics used only a single dose of UBI --not surprisingly, with no effect.

Another critical study (Schwartz et al. (1952)) was funded in part by the American Medical Association and appeared in its Journal. Again, even though the researchers quoted Knott on the point that it was not the direct treatment of the blood that destroyed the bacteria but rather the effects in vivo of small, repeated doses, they proceeded to test the direct bactericidal effect of the UBI device and found it wanting. They then tested UBI on 68 patients with a wide range of symptoms. UBI reduced ulcers in 5 out of 8 patients but was apparently ineffective against most of 11 cases of pelvic inflammatory disease (PID). The study had serious flaws, however. The 23 cases of hepatitis were acute ones which would presumably have resolved with or without intervention. No report was made on the effects on 7 arthritis patients, and objective improvements in various indications were glided over. Most PID patients received only 1-2 treatments, even though their cases were generally severe. In certain PID cases, the researchers turned off the device to test whether the patients would report subjective improvement (they did). But the researchers then listed these treatments as if the device were turned on. In one case, a patient listed as having three treatments apparently received no UBI whatsoever. The researchers' scatter-gun approach on other indications was of anecdotal value only, especially since the samples were too small (often a single patient), criteria for improvement were not provided, and there were no controls. In addition, no effort was made to distinguish between the effects of UBI on early and late stages of a disease. It is hard to avoid concluding that this study revealed more about the bias of the researchers and the AMA than it did about UBI.

In Europe, Czech physician Karel Havlicek and others began using UBI via muscular reinjection of small doses, often just 10 ml. Federico Wehrli treated oxygenated blood with UV in a procedure termed Hematogenic Oxidation Therapy (HOT). Since then, HOT has enjoyed a certain popularity in Central Europe.

The dramatic advances in antibiotics, vaccines, and corticosteroids in the 1950s put a halt to the growing interest in UBI therapy. Amid the enthusiasm over the new wonder drugs, only a handful of physicians continued to use it. Even though it was illogical to set aside a therapy that could treat viral diseases (e.g., chronic hepatitis and viral pneumonia) that were impervious to antibiotics, this illogicality came to pass. From 1955 until the 1990s, only a few American physicians continued to work with the UBI device. It did, however, receive FDA status as a device that was sold and distributed in interstate commerce prior to 1976 (510(k) status).

In Germany practitioners persisted in using UBI . By the 1980s, UBI had become popular among East German and Russian physicians. In the 1990s, Russian physicians began to use low-intensity lasers to treat the blood through a fiber inserted into a vein with an IV needle (LUBI). Now interest in UBI has spread to the United States. The rise of multidrug resistance of strains of bacteria, concerns over the side effects of drugs, efforts to control costs, and the HIV epidemic have led medical researchers and physicians to seek to combat infectious and autoimmune diseases with innovative approaches such as UBI .

How UBI Works

UBI Therapy is effective against many disorders. It was a significant lapse for American medical science to ignore the documentation--including several controlled studies--that had been developed over 30 years beginning in 1928 regarding UBI treatment of hundreds of thousands of patients by reputable physicians. It is also hard to justify the way that American medical science has overlooked the many reports of clinical trials of UBI and LUBI in Russian and East German medical journals and books over the past two decades, especially given the intense effort to identify promising approaches to the treatment of HIV and related conditions. Now it is necessary to fund and organize clinical trials that will permit this therapy to be validated for widespread use in those indications for which it is most appropriate.

UBI 's Mechanisms of Action

From the early years of UBI therapy, Knott and his associates sought to explain how UBI treatment works and its therapeutic effects. They and subsequent researchers identified two possible modes:

- 1) The UV treatment of the blood in the treatment chamber destroys or alters bacteria and viruses in the extracted blood in such a way as to create a kind of vaccination effect when they return to the body. This provokes a reaction by the immune system which in turn destroys most or all of the other bacteria or virus in the body;
- 2) The treatment of a small fraction (some 5 percent) of the blood then spreads throughout the entire volume of the blood upon returning to the body, and this induced secondary radiation (biophotons are emitted by the activated cells) destroys virus, bacteria, and--in autoimmune diseases--activated white blood cells.

The lack of detailed understanding of immunology at the peak of the use of UBI therapy in the United States in the 1940s kept researchers from determining which of these two effects is more powerful, and in which applications. It also obscured a possible third pathway: that the treatment itself, though quite modest in level, has an impact on the autonomic nervous system (hence the frequent instances of flushing of the skin) and is perceived as a threat/stimulus by the entire immune system, which springs into action and thereby contributes to destroying bacteria or virus.

It is well known that bacteria and viruses are more vulnerable to Biophotonic emissions than are somatic cells. UBI forms pyrimidine dimers and otherwise disrupts the DNA of microorganisms. In contrast, as long as somatic cells are not metabolically active, they have the capability of withstanding modest amounts of biophotons emitted by blood cells.

Knott and other early researchers noted that UBI has a complex effect on the immune system. On the one hand, UBI stimulates the activity of white blood cells; on the other, excess amounts destroy various white blood cells. The first effect is the basis of the immune response explanation of the beneficial effects of UBI . The second suggests a reason why UBI seems so effective against autoimmune diseases. In autoimmune disorders it appears that the metabolically active T-cells and other immune cells absorb much greater numbers of biophotons than ordinary body cells, and this destroys them, thus slowing down or stopping the disease.

Activated T-cells in particular are prone to absorb secondary biophotons following UBI as a source of energy just as they absorb at a very high rate glucose and other energy-bearing molecules. In effect, they are tricked by evolution. Having specialized for hundreds of millions of years within the controlled environment of the bodies of animals in the art of absorbing as much endogenous biochemical energy as possible (via the "glucose shunt" a cell can absorb over 1,000 molecules of glucose per second) to achieve the high levels of activation needed to orchestrate and drive the powerful response of cellular immunity, they are not equipped to switch to shutting out excessive energy that is triggered from outside the body.

An Energy Gradient

The remarkable specificity that UBI demonstrates can best be explained by the body's own system of shuttling energy around to the places it is needed. This effect can be seen most readily in the fulminating conditions against which UBI has shown itself to be so formidable. These conditions--e.g., fulminant hepatitis--suck into themselves an unusually high amount of energy in the form of glucose and other energy-bearing molecules. Without this energy, there could be no fulmination; and this energy is made available from system-wide, not merely local, sources. As the fulmination spirals upward, the body smoothly fuels it with energy, suggesting that there is a kind of Energy Gradient in the blood--a system whereby the body supplies energy to the various processes in it on demand and, if necessary, to a far higher degree than would occur by the mere undirected circulation of energy-bearing molecules via the blood.

This Energy Gradient explains the exceptional specificity of UBI in fulminating conditions: in effect, the blood cells emitting biophotons are channeled as energy directly toward the fulmination, where the concentrated energy destroys the activated immune cells (or, in the case of necrotizing pancreatitis, the activated enzymes) that are driving it. In these circumstances, even amounts of UBI well over the normal dosage tend to do little or no peripheral damage, in contrast to treatment with various chemotherapies.

Another possible explanation of the effectiveness of UBI in the special case of liver diseases is that the blood-filtering action of the liver tends to concentrate the secondary emissions to a far higher level than the modest levels in the circulating blood. This effect would suggest that UBI might be equally effective in the treatment of Idiopathic Thrombocytopenic Purpura (ITP), an autoimmune disease of the spleen, another blood-filtering organ.

In addition, as a fluid the blood is capable of delivering the secondary biophotons emitted during UBI to hard-to-get-at locations in the body which other kinds of radiation cannot reach without damaging tissue. The result is higher specificity. This would explain the action of UBI in neurological disorders such as petit mal seizures. A highly successful LUBI treatment of schizophrenics with depressive syndrome resistant to all drugs (dramatic improvement in 8 out of 8 cases) resulted from the ability of the treated blood to destroy metabolically active white blood cells blocking microcirculation in the brain, for instance (Stulin et al. (1994)). In turn, this action suggests a possible role for UBI in the treatment of major depression as a substitute for Electroconvulsive Therapy. UBI can be seen as a kind of glucose and ATP antagonist/ substitute/overrider and thus as a suppressor of any excessive metabolic activity in the brain--or for that matter anywhere else in the body.

In contrast, in the lower concentrations with which UBI Therapy affects cells, enzymes, and other factors that are underperforming in certain disease states, e.g., fibrinolytic elements in arteriosclerosis, UBI has a stimulating effect. Thus its overall action is to normalize the situation by suppressing excessively active factors and stimulating underperformers. A single dose of UBI can therefore be both "immunostimulatory" and "immunosuppressive" depending on which sets of cells are under discussion. Likewise, an initial dose of UBI can stimulate a cell, but then repeated doses can eventually inhibit it or destroy it. Once UBI inhibits or destroys cells with excessive metabolic activity, glucose that would otherwise flow to them becomes available to underactive cells, which enhances the normalizing effect.

In certain disease states double- and even triple-concentration effects may occur, and these can powerfully boost UBI's specificity. For instance, in a case of fulminating primary biliary cirrhosis, the initially mild level of secondary emissions in the blood could be concentrated in three ways: by the filtering action of the liver, by the blood's Energy Gradient, and by the differential absorption of the biophotons by the activated T-cells. These effects would not merely be added to each other; they would be multiplied by each other, leading to an exceptional specificity that would explain why a relatively modest amount of extracorporeal UBI can have the dramatic localized effect that it does. Of course, the labyrinthine structure of the body ensures that such a concentration does not occur in a straightforward, mathematical manner; it is the tendency toward such a concentration that counts.

Affects in Blood components

The literature on UBI places a good deal of emphasis on the way it oxygenates and otherwise improves the characteristics of the blood (rheological characteristics, vasodilation, improvement in peripheral circulation). This effect occurs with unusual rapidity following transfusion of treated blood and can transform severely aggregated clumps of erythrocytes and platelets into normally diffuse, free-flowing arrays within minutes. Whether this effect should be considered part of UBI's mechanism of action or rather a consequence of it, it clearly is useful in the treatment of many disorders, e.g., in achieving the gratifying results reported by Russian physicians in treating cerebrovascular, heart, and lower limb circulatory disorders. UBI also significantly lessens internal bleeding after operations while permitting operations on the veins of the lower extremities with a reduced danger of renewed venous thrombosis or pulmonary embolism (Brill' (1996)). Blood oxygenation might be connected with a known side effect of UBI treatment: the creation of a small amount of ozone in the blood. It is not clear whether this ozone has any beneficial or deleterious effects.

Other short-term effects include: a modification of erythrocyte membranes that releases substances into the blood that appear to stimulate further changes; structural changes in plasma proteins (IgM can be activated up to 16 times normal); activation of complement; immediate release of free radical oxygen, followed by a rise of antiradical factors; expansion of blood volume and slight decline in hematocrit; a drop in blood pressure; degranulation of granulocytes and mast cells; short-term decline in the number of platelets and sometimes in their functioning; activation of fibrinolytic factors and reduction in the activity of coagulants; and enhanced phagocytosis. In effect, the entry of the energy from UBI into the blood--a dynamic, energy-bearing fluid--changes the "correlation of forces" in the body in dozens of ways that benefit the entire organism.

It is possible that the fragments of bacteria, virus, and cells that are destroyed by UBI act as a kind of vaccine in the plasma, enhancing the immune response. UBI also reverses the suppression of the detoxifying function of the liver.

Finally, UBI may be accompanied by psychologically-induced effects akin to a placebo effect and arising from patients' perception of it as especially powerful or as more natural than chemotherapy. In a clinical trial of LUBI in rheumatoid arthritis, a control group of 18 was given an "intrusive placebo" that consisted of the daily insertion of the IV laser waveguide, except that unbeknownst to them the laser beam was not turned on. Two patients had "significant improvement" and 12 had "improvement", which equaled the effects achieved by another group that received 4-6 sessions of LUBI over the course of two weeks--though it was nowhere near as good as the response of two groups that were treated daily for six days (Zvereva et al. (1994)).

Overall Assessment

In sum, UBI Therapy operates in a somewhat complex manner but frequently with a surprisingly simple specificity and consequent virtual lack of side effects. In infectious diseases, the immunostimulatory effect and the induced secondary biophotons work in tandem. In autoimmune disorders, the concentrated secondary biophotons appear to be the main mode by which UBI obtains its effects, suggesting that even in infectious diseases they play a much more important role than the immunostimulatory effect.

The hypothesis that the focused induced secondary emissions of biophotons are the most important mechanism of action of UBI fits perfectly the pattern of damage that unusually high doses of UBI can do as well as the known pattern of specificity of antimetabolite drugs (e.g., 2-CdA/Cladribine) that resemble UBI in the sense that they mimic energy-bearing molecules. UBI can be viewed as the single most powerful of the antimetabolites.

The method of action of the energy-bearing secondary emissions from UBI appears to lend it higher specificity than many chemotherapies aimed at the same applications, since to attain their effects such chemotherapies must deviate from the ideal purity of energy-bearing molecules such as glucose and ATP (Dillon (1994), pp. 37-45). This suggests in turn that the negligible observed side effects of properly administered UBI treatment are not the tip of an iceberg of hidden damage but rather that UBI indeed has exactly the exceptionally high specificity that the above energy-bearing model implies. In other words, UBI Therapy is not only safe; it is safer than competing chemotherapies.

The dramatic advances over the past 50 years in medical science's understanding of physiology and in its

ability to monitor disease states mean that it will now be possible to achieve a better grasp of how UBI works. In turn, this will provide insight into various physiological processes as well as an opportunity to fine-tune the therapy and apply it to new indications, thus achieving significantly better results than the pioneers of UBI were able to obtain.

Frequently Asked Questions about UBI

How does the UBI device work?

The accepted standard of UBI is to treat a small portion of the blood for a limited amount of time and to repeat this treatment at intervals that are appropriate for the disease and its intensity, e.g., 3-4 sessions spaced one week apart to treat chronic hepatitis B. It is thought that in this way any danger that might arise from treating the total volume of the blood or treating the blood with a higher intensity UV source or for a longer time can be obviated. Clearly, in a fulminating condition, it might be necessary to use a higher dosage and/or to repeat the normal treatment at very frequent intervals to save the patient's life.

The standard procedure (Knott Technique) with the Knott Hermo-Irradiator device is to withdraw 1.5 ml of blood per pound of body weight (up to a total of 250 ml) by venipuncture into a transfusion flask fixed with an anticoagulant. The blood is pumped through tubing at an automatically controlled rate. The blood flows through a cuvette where it is exposed for up to ten seconds to a controlled amount of ultraviolet in the accepted therapeutic band of UV-A, UV-B and UV-C. When the correct amount has been treated and stored in a flask, the direction is reversed and the blood is treated second time on its passage back into the body through the same needle used for withdrawal.

Using gravity feed, the procedure takes about one hour including 10 minutes for set-up and 10 minutes for clean-up. Using the pump cuts the total time to about 30 minutes. The UV lamp should be turned on for 5-10 minutes to allow it to warm up.

For single treatments, in accordance with modern medical practices, a disposable cuvette is used. The accessories (tubing and needles) are also single use and disposed of after each usage. In the case using the flat cuvette in poorer countries that will require repeated treatments, the patient's name can be etched on the crystal cuvette and the cuvette can be cleaned and sterilized.

What is the regulatory status of the UBI device?

As a medical device that was in interstate commerce prior to 1976, the UBI device may be legally marketed in the United States by the original manufacturer or its lineal descendant without any claims being made regarding specific indications, according to the rules of the U.S. Food and Drug Administration (FDA). This is not the same as "FDA approval", which would require demonstrating that it is effective and safe for specific indications by means of controlled clinical trials. A Russian model has been marketed in the United States, but the FDA has recently questioned its status. The FDA has approved the principle that ultraviolet treatment of the blood can convey therapeutic benefit (see below).

Who is authorized to use a UBI device?

In the United States, any licensed medical practitioner is authorized to use a UBI device if done so under Sec 21 of the FDA code.

Which is better: UBI or LUBI ?

The mechanisms of action and therapeutic effects of these two modes of UBI are similar, yet there are LUBI differences. In a study of the treatment of 312 workers who had received significant doses of radiation during the cleanup of the Chernobyl nuclear accident, the Helios UBI device was used on 54 and LUBI on 126, with 132 receiving standard pharmacological treatment for a range of disorders: vegetative dystonia, dyscirculatory encephalitis, hypertonic disorder, gastro-intestinal disorders, chronic hepatitis, and chronic bronchitis. A normalization of microcirculatory and immunological indicators occurred in 73 percent of the UBI cases and 84.8 percent of the LUBI cases. But 39 of the LUBI cases received an extra drug as well, and no follow-up tests were done to identify delayed effects (Frolov et al. (1995)).

Clinical trials in Vladivostok of the comparative effectiveness of UBI and LUBI in conjunction with fasting in the treatment of hundreds of patients with bronchial asthma yielded a nuanced but highly interesting result (G.I. Sukhanova (1993)). No differences were found in the effects on bronchiectasis. LUBI had a more rapid effect overall and was superior in terms of bronchodilation and hyposensitization, while UBI had a more marked bactericidal and antiinflammatory effect. Two weeks after treatment, however, UBI obtained better results in terms of microcirculation as well. LUBI brought a rise in the absolute number of lymphocytes and the number of helper T-cells as well as a decline in the number of B-cells and the phagocytic activity of neutrophils, whereas UBI lowered the absolute number of lymphocytes, the number of B-cells, and the phagocytic activity of the neutrophils. The researchers concluded that LUBI 's greater ease of use and more rapid effects made it superior for less serious cases of bronchial asthma, while UBI was to be favored for more serious cases with infectious features. They noted that either approach combined with fasting conveyed a "beautiful therapeutic effect."

The trials did not test the comparative merits of UBI or LUBI as a stand-alone therapy versus their use in conjunction with fasting. In addition, the specifics of bronchial asthma may not pertain in other indications. Moreover, the differences between UBI and LUBI were not great and may have arisen from unintended differences in dosage, though the fact that the curves of the results of LUBI and UBI crossed each other as UBI forged ahead in the second week after treatment suggests that the dosages were roughly equivalent. UBI 's superiority also showed up in four successive trials on bronchial asthma in hundreds of patients--a powerful indication that in fact it has a more profoundly therapeutic effect.

The reported advantage of UBI in treating severe cases may not have been due to the known bactericidal and virucidal effect of UV at all because relatively few cells were directly treated with UV. Three other possible explanations are: 1) the greater number of wavelengths in UBI stimulated the treated cells in a more intense, "complete" way reminiscent of solar light than did the single wavelength of the red laser; 2) the addition of ambient photons in the extracorporeal mode of UBI might have provided greater stimulation; and 3) UBI had a more profound impact on the marrow. The delayed effect of UBI could have arisen from the production of more cells in the marrow over the course of 10 days. The stimulatory effects of UBI in the marrow are little studied and could be an important source of insight.

LUBI has the advantages that the hand-held device is easy to use and the dosage can be precisely calculated. It also does not require a treatment chamber, so there is no need for cleaning quartz cuvettes or paying for disposable ones. LUBI has no requirement for an anticoagulant, a major plus. There is, however, some concern because the laser beam, even though it is at very low intensity, does minor damage to red blood cells.

The UBI device's advantage is that it can be used by any individual with basic medical training, thus saving the expense of physician's time and permitting its use in situations where a physician is not present. UBI has the advantage, too, of all extracorporeal blood treatment that the blood also absorbs ambient photons that can have a beneficial effect once it returns to the body.

Which wavelengths are most effective?

Provisionally speaking, UBI appears to convey roughly equivalent effects at all UV, visible, and near infrared wavelengths. Many aspects of photobiology, however, are open to reinterpretation since the original work in this field did not take into account the LUBI effects of such phenomena as magnetic fields. For instance, the spectral peak of a given artificial source of various wavelengths is not necessarily the wavelength at which it is most effective.

How many UBI treatments can be safely given?

Various Russian and German authors mention 15-20 treatments or even as many as 30. In the older European muscular injection method, up to 50 small doses (as little as 10 ml) were given. In Israeli Center for Bio-Energetic Therapy's view, as long as there is an interval that will permit recuperation or replacement of sensitive cells--perhaps one or two months between treatments--UBI can be used indefinitely in the case of a chronic disease that needs to be suppressed at regular intervals. The danger of inducing a cancer at such low levels of treatment, always administered to a different set of cells, is minimal.

But isn't there a possibility that the treatment could cause long-term effects?

It is true that no long-term studies of UBI 's effects have been done. However, UBI is much lower in intensity and far less concentrated on a specific target than were the x-ray treatments of the 1930s and 1940s that led to cancers decades later. The relatively rapid turnover of the blood cell population also reduces the impact of UBI . In contrast to x-rays, little of the UV from the Russian UBI device is ionizing; in UV-A devices, none of it is. None of the currently used LUBI devices emits ionizing photons.

Logic and anecdotal evidence suggest that UBI has a prophylactic action against cancer. An East German study of mutagenicity in chromosomes before and after six sessions of UBI found that in fact chromosomal aberrations had diminished in number, leading to the hypothesis that UBI could actually stimulate DNA repair (Frick (1989)). There is also not a shred of evidence that properly dosed UBI consistently damages any specific organ or tissue of the body such as lymph nodes other than the minor damage that it does to the membranes of many red and white blood cells. Even there, in applications such as the treatment of preeclampsia, there is evidence that it stabilizes membranes against lipid peroxidation (Bednarskii et al. 1995)

If UBI is so safe and effective, why is it so little known outside of Russia and Ukraine?

1) Medicine in Western and technologically advanced East Asian countries has gone down the path of molecular biology. Physicians and researchers trained in biochemistry (and often with very little knowledge of physics) sometimes look askance at biophysical approaches--though some start to take UBI seriously once they learn more about it. 2) Statements regarding UBI can easily be associated with the myriad specious claims of wonderfully curative devices by enthusiasts and charlatans. 3) The present association of UBI with things Russian can hurt it in the eyes of those who are aware of the financial and technical weaknesses of the Russian medical system. 4) The general low prestige of Soviet and East German communist systems as well as the lingering effects of Western Cold War propaganda against them have led to a tendency to belittle the genuine but little-known contributions of their scientists. 5) The lack of Russian- and German-language skills among Anglo-Saxon and East Asian researchers leads to a mentality in which it is hard for some to accept that there could be a cutting-edge therapy like LUBI on which almost none of the scientific literature is in English. 6) Many physicians have surprisingly little knowledge of the real history of their own specialties; they know the textbook history and the English-language medical literature of the past 25 years, neither of which includes UBI . 7) In turn, this leads to an NIH (Not Invented Here) syndrome--the irony being that UBI was invented here, and the Russians were Johnnies-come-lately to it. 8) Since the mid-1950s, the few American practitioners of UBI have chosen to treat patients quietly rather than do battle with state medical boards. The effectiveness of UBI ensures that they do a steady, lucrative business with patients who prefer their services to those of colleagues. 9) The relatively low cost of UBI has never attracted a major medical corporation to back it, yet organizing clinical trials to validate UBI will require considerable effort and financial resources. 10) Lastly, the difficulty of discovering the underlying mechanism of action of UBI long deprived its advocates of a valuable weapon.

But surely American advocates of alternative medicine would have displayed interest in UBI if it were effective?

Knowledge of Russian, German, physics, and the real history of medicine is not exactly their strong point either. In addition, UBI never was part of some broader approach to medicine; its links with therapeutic UV treatment of the skin were always weak. So, unlike a Chinese herbal remedy, for instance, UBI has no long tradition and no large, permanent constituency to back it. Thus one can consult many handbooks of alternative medicine that discuss the most arcane and dubious therapies without finding a single mention of UBI . When UBI is mentioned, it is almost invariably without any true comprehension. UBI slipped through the cracks between standard and alternative medicine. However, there are two valuable recent books on UBI by William C. Douglass, M.D. (1996) and-- posthumously--by George P. Miley, M.D. (1997); and certain American physicians are expert in its use.

In what circumstances can UBI devices be used?

The portability of the devices makes them suitable for use in a variety of settings. A nurse can bring a UBI device to the homes of bedridden patients, with the added benefit of ensuring compliance. In developing countries the UBI device can be used by medics in remote villages that have electricity under the long-distance supervision of a centrally located physician. Or a traveling physician can take a low-intensity laser or UBI device on his/her rounds. UBI units can also be deployed in battery fashion in a large clinic under the

supervision of a single nurse (with an aide to assist in setup and cleanup), though it is advisable to have only two patients per nurse at any time and one-on-one is better to monitor the patient and insure that the blood does not coagulate.

So UBI could be of value in the Third World?

The modest cost, simplicity of use, and versatility of UBI Therapy peculiarly suit it to the needs of Third World countries. If the fragmentary but highly suggestive findings regarding UBI 's effectiveness against chronic hepatitis can be validated, for instance, UBI could significantly reduce the incidence of chronic hepatitis in Africa.

Does concomitant administration of other therapies enhance or dampen UBI 's effect?

Some practitioners warm up an inflamed joint prior to administering UBI to enhance specificity, though it is not clear if this procedure has any effect. Magnet therapy has been used in conjunction with LUBI in Russia (Komarova and Yegorova (1994), pp. 16-19). Claims are made that oxygenation therapies boost the effect of UBI , though in all such cases one must ask whether there is an accompanying added toxicity. Concomitant administration of glucocorticoids, non-steroidal anti-inflammatory drugs, and Vitamins C and E diminishes the effect of UBI . Logic suggests that antimetabolites like methotrexate and various nucleoside analogs would also reduce UBI 's effectiveness. Sulfa drugs and other photoactive drugs should not be administered for several days after UBI treatment in normal (e.g., high for the circumstances) doses; their excessive activation can be dangerous.

The early American practitioners found that UBI was most effective as a monotherapy. In a retrospective study of 9 cases of typhoid fever, the 3 patients treated with UBI alone recuperated more rapidly than 3 treated first with sulfa drugs, then with UBI . Of 3 treated with sulfa drugs alone, 1 died and 2 had very long recuperations (Rebeck and Lewis (1949)). Similarly, excellent results were obtained in the treatment of bronchial asthma with UBI as a monotherapy. The two major studies suggested that long-term maintenance treatment with UBI was highly effective and that the results with childhood bronchial asthma were outstanding.

Curiously, in a study of UBI in bronchial asthma (Miley et al. (1943)), there is evidence that the researchers were systematically understating their results, in part because of excessively strict criteria. Of the 9 patients under the age of 20, the 8 who remained in the study were consistently given scores that were below the written characterizations of their end status. This "self-abnegating scoring" is characteristic of a situation in which researchers slant their results in a negative direction in order to avoid hostile criticism that they are exaggerating them. Since the lead researcher was George P. Miley, M.D., as director of UBI at the Hahnemann Medical College perhaps the top UBI practitioner in the US, one who administered over 16,000 treatments with UBI , and the most prolific researcher on UBI , this suggests that the early American proponents of UBI were deliberately understating their case. They evidently thought that it was so compelling that their colleagues would eventually grasp the point, and they wished above all to avoid any sensational claims that would allow critics to lump them with the many kooks who have always been attracted to electromedical devices. At one point, George Barger, M.D. even suppressed an article on UBI by the father of a successfully treated child that was scheduled to appear in a popular magazine.

One weakness of the Russian clinical trials of UBI is that standard drug regimes are often continued during UBI treatment. Ironically, the reason for this is that, far from being indiscriminate in their employment of UBI ("zapping the patients", as the crude image of ignorant Westerners would have it), Russian physicians have generally been excessively cautious. Their unusually sensitive applications of UBI (e.g., in late-term pregnancy) have been the outcome of step-by-step, patiently observed and tested advances against less sensitive conditions. This means, however, that UBI is probably even more effective than appears in the results of the Russian trials if used as a stand-alone treatment. In addition, most recent Russian trial data pertain to LUBI , which is demonstrably somewhat less effective than UBI .

During the war in Afghanistan, the Soviet military undertook a secret, well-funded UBI research and development effort that culminated in the construction of the Helios device. Patterned on the Knott device, it was used to suppress post-operative infections on the battlefield and in military hospitals in Central Asia. Thus one more reason that UBI therapy is not so widely known is that in at least one important application it was and still to some extent is a military secret.

In East Germany, out of a concern over possible increased mutagenicity resulting from UBI, practitioners deliberately steered clear of treating younger patients, even though they acknowledged that there was no evidence to support this concern and their own studies showed it to be unfounded. As a result, their clinical results--though excellent--were derived from a patient population that was much older (53.7 years) than average and thus considerably less likely to respond as favorably as younger patients would to UBI; and they treated sexually transmitted diseases and other major indications for UBI only rarely. As for the earlier German practitioners, they ordinarily used muscular injection of extremely low doses of treated blood, a less effective approach than the Knott technique.

In other words, it appears that, far from exaggerating, American, Russian, and German studies of UBI Therapy systematically understate its potential effectiveness.

Has any practitioner ever used UBI in an optimal manner?

Yes, Robert C. Olney, M.D. As a senior surgeon based in Lincoln, Nebraska, Olney had the intuitive understanding to push UBI to its limits because he saw how low its toxicity was. Over the course of 30 years he treated many thousands of patients for a wide range of serious indications. He published a series of highly interesting studies, e.g., of the use of UBI in pelvic inflammatory disease where he achieved a ratio of 80 percent totally successful outcomes in severe, refractory cases (Olney (1947)). He resorted to surgery only in the 20 percent of cases in which there was a clear cyst, tumor, abscess, or other obstruction. Olney repeatedly achieved results superior to those of his colleagues, even in difficult indications.

What can explain this record? 1) He was exaggerating (*probably the opposite ed*). The many wavelengths of the Knott device made it more effective than other devices. 3) He used UBI as a monotherapy except in post-heart attack cases. 4) He would administer as many treatments as the patient's condition required, secure in the knowledge that as long as there was a diseased state in the body, UBI would do no harm. There is a good deal of evidence that Olney was one of the great physicians of the 20th century.

Are there any special modes in which UBI is being administered?

Russian physicians have treated marrow cells to treat osteomyelitis, cerebral spinal fluid to treat multiple sclerosis, and portal blood to treat hepatitis. Ukrainian physicians are experimenting with pulsed LUBI timed to the patient's heartbeat in order to optimize the effects of a given dosage and, with the help of computers, take a step toward the goal of real-time monitoring of LUBI. In Odessa they are experimenting with the use of noncoherent light for UBI.

An occasional practice is to use treated donor blood, though it is not clear what advantage this might confer over autologous transfusion of treated blood. However, in the literature of UBI there are no reports of serum hepatitis following transfusion of UV-treated donor blood. This led Russian researchers to conduct a study of the treatment of 31 samples of donor blood with antigen to hepatitis. They found that UV-C treatment removed any trace of antigen from 67 percent of the 15 samples treated with it, and UV-A had a score of 50 percent of 16 samples. They recommended that this method be used to reduce the risk of transmission of serum hepatitis (A.V. Marchenko et al. (1990)). It is also an excellent way for countries in which blood supply is not of high quality to lessen the chance of transmission of viruses since the in vivo action of UBI will also help to destroy infectious agents infused with donor blood.

Are there any contraindications to the use of UBI ?

The original Soviet regulatory documentation for the Izolda UBI device listed the following contraindications: 1. Difficult cases of cardiac insufficiency of the left ventricle failure type. 2. Within three weeks of myocardial infarction. 3. Acute cerebral insufficiency and acute disturbances of cerebral circulation. 4. Gastroduodenal hemorrhage. 5. Photodermatitis. 6. Hypoglycemia. Subsequent clinical studies in Russia and Ukraine make it clear that UBI is much safer and more effective in heart disease than these regulations would suggest (Sirenko et al. (1990)). Many clinical trials of UBI in neurological and psychiatric disorders suggest that it is safe in acute cerebral disturbances as well, though this question deserves further study. The small risk of hypoglycemic shock can be avoided by feeding an at-risk diabetic patient carbohydrates just before or after UBI treatment.

UBI has been used in Russia in careful studies with great effectiveness and safety to correct fetal conditions hard to treat with drugs as well as infections, hypoxia, and slow growth of newborns (Matsuyev et al. (1990)),

p. 8). In a clinical trial of 91 pregnant women with preeclampsia, for instance, the 61 who received LUBI for 7 days in a row had only 20 percent of caesareans and induced premature births on account of the disease whereas 30 controls had 31 percent of caesareans, all on account of severe preeclampsia, as well as 30 percent of induced premature births. The babies born to the LUBI group were virtually identical in weight and height to those of a third group of 11 healthy controls (Bednarskii et al. (1995)). In the United States, where preeclampsia is the second leading cause of mortality in pregnancy and a significant cause of fetal defects and deaths, there is no treatment for severe preeclampsia other than induced preterm delivery.

What are the known side effects of UBI ?

1. Flushing in some cases. 2. Creation of a small amount of ozone. 3. Destruction of some immune cells, depending on the dose. 4. In cases of disseminated infection, the rapid destruction of high numbers of infectious organisms can temporarily create toxic symptoms that subside as the organisms are cleared from the blood. 5. In 50 percent of bronchial asthma patients, there is a flare-up of symptoms following the first treatment with UBI ; similar flare-ups can occur in rheumatoid arthritis. Subsequent treatments are uneventful.

While some practitioners consider UBI to be without any damaging side effects whatsoever, one well-informed German source (Frick (1989), pp. 54-55) reported side effects in 15.3 percent of cases (84 of 550), including hypoglycemic shock (4 cases, probably diabetics or others with a tendency toward hypoglycemia), allergy (10), tiredness (7), fever (7), inflammatory responses in tooth root granulomas (5), gastritis (4, one case of which required cessation of UBI), and exacerbation of asthma (2, in one case requiring cessation of UBI). Frick admitted that his list included various phenomena that may not be connected with UBI at all and that many of the reactions were trivial. He regularly administered up to 10 treatments of UBI , and sometimes more, at frequent intervals. His patient population was also unusually old--averaging 53.7 years; thus it was a good deal more likely to report side effects than a more resilient youthful population. Frick himself considered the incidence of side effects to be low.

A Russian study of 2,380 sessions of UBI revealed that 1.3 percent of patients had minor complications--hematomas at the IV site, coagulation in the tubing, shivering, dizziness, and nosebleeds. In addition, one had hypoglycemia, one had bronchospasms characteristic of her reaction to other treatments, and one had a nettle rash (urticaria) (Marochkov et al. (1990)).

These German and Russian findings as well as Knott's experiments with dogs suggest something very plausible: that UBI actually has a profile of damage to vulnerable sets of body cells that closely parallels that of nucleoside analogues. The difference is that UBI 's greater specificity gives it a considerably higher therapeutic ceiling than competing chemotherapies (or herbal remedies, for that matter), so such damage only occurs with a relatively larger dose of UBI .

In the older American literature are noted a few citrate reactions; some reactions to the death of high numbers of bacteria in disseminated infections, characterized by chill, fever, and temporary symptoms of toxicity that subsided after several hours; flare-ups after the first administration of UBI in bronchial asthma and autoimmune disorders; and some lassitude and sleepiness in individual cases. Miley (1997, p. 22) noted one 1944 report of a death following a severe reaction in an acutely septic patient after UBI . He suggested that a cleaning error in the care of the UBI device might have allowed a piece of old, dried fibrin to cause this reaction.

Have the UBI device or LUBI lasers been tested in controlled clinical trials?

Both UBI and LUBI have been tested extensively in clinical trials, particularly in Russia and Ukraine. In recent years these trials have been employing increasingly strict protocols, including controls and sophisticated statistical analysis, though double-blinding, proper randomization, and multicenter trials are still not the norm. Another difficulty in assessing UBI 's effects arises from the tendency to employ UBI as part of combination therapy rather than as a stand-alone treatment. And often there is no report of long-term follow up.

Several trials and studies with historical controls were carried out in the US, but none since around 1960. Much of the early American reporting on UBI consisted of series of case reports. In general, the Russian and Ukrainian results have a higher validity than earlier American and German ones. The Russian and Ukrainian laboratory and clinical studies have been more rigorous and are based on a much more sophisticated understanding of immunology and general medicine than was available 50 years ago. In

addition, they have not been subject to the commercial forces that shape and sometimes corrupt the clinical trial process in Western countries.

What is the relationship between UBI and photopheresis?

In the 1980s Yale University researchers independently developed a method of blood treatment that is termed "photopheresis" or Extracorporeal Photochemotherapy (Edelson (1988): this article in Scientific American did not mention UBI or the work of the UBI pioneers although the author had cited the 1928 UBI device patent in his own patent application). They use photoactive drugs, filters, and separation of the white blood cells from the red blood cells in the plasma. This treatment costs \$2,000, requires sophisticated equipment, and takes many hours. Photopheresis uses a low-intensity fluorescent source of UV-A while the Russian UBI device employs a high-intensity mercury-quartz source of UV-B or UV-C. Many medical centers now use photopheresis.

In effect, photopheresis is a combination of UBI and chemotherapy in which the secondary emissions trigger the photoactive drug previously taken up by the target cells. Thus to achieve the same effect, photopheresis uses less blood treatment and more chemotherapy than UBI. The substances used are generally psoralens, which occur in nature but are used in chemotherapeutic concentrations that can have more toxic effects than other forms of UBI (Edelson (1991)). The two therapies appear to have roughly the same effectiveness, with UBI presumably having an edge with equal doses of "medicine" (i.e., of toxicity) because of its higher specificity. Photopheresis is probably effective for most of the indications UBI is effective for, and the opposite is presumably also true.

Photopheresis has these comparative advantages: it is approved by the FDA for the treatment of cutaneous T-cell lymphoma; it is currently in clinical trials for other indications; hundreds of photobiologists have studied it; there are many recent English-language publications on it; and it is available in many medical centers.

UBI has the comparative advantages that both the device and the treatment are much less expensive; the duration of the treatment is briefer; the UBI device can be used by any individual with basic medical training; the device is more portable; UBI has been used on a wider range of indications; and UBI's activation of red blood cells temporarily transforms them into a dynamic component of the immune system. Two additional considerations are that some step in the procedure of photopheresis (e.g., centrifugation that permits the UV to concentrate on lymphocytes) might confer an advantage on it; and, conversely, the apparent exceptionally high specificity of UBI may make it "cleaner" than photopheresis, which relies on chemotherapy and has minor side effects. A comparative trial of photopheresis and UBI could shed light on both of them.

An important implication of the FDA approval of photopheresis is that the FDA thereby accepted the principle that a therapeutic use of UBI could be both safe and effective.

How does treatment of the skin with UV relate to UBI ?

UV and other forms of treatment of the skin convey internal and general benefits that are mediated by the blood. UBI is superior to them in terms of effectiveness, safety, and consistency.

Isn't it hard to believe that all of the UBI -activated blood cells are channeled directly to the problem spot without any ending up in the wrong places?

Yes. In fact, it is clear that some of the secondary biophotons directly affect the neurons that activate the autonomic nervous system (hence the flushing of the skin) and some of them stimulate the entire immune system. In addition, some secondary biophotons are dispersed around the body. All erythrocyte membranes appear to be altered somewhat, for instance. One explanation for the lack of observable side effects would be this:

Divide the cells of the body and any infectious organisms in it into three categories of energy-demanders: A--high; B--moderate; and C--low. Into Category A would fit active infectious agents and activated immune cells. These would absorb an inordinately large share of the available blood glucose and, in parallel, of the secondary biophotons from UBI. The cells in Category B--those cells in the stomach, mouth, brain, and elsewhere with somewhat higher metabolism than ordinary body cells and therefore the ones most often

damaged by chemotherapy--would absorb only a small amount of secondary biophotons because the blood's energy gradient would direct the main pulse of them toward the infectious organisms or activated immune cells (A). Meanwhile, the overwhelming majority of body cells would belong to Category C. Billions of them each would absorb an amount of secondary emissions equivalent, perhaps, to a few stray biophotons.

The initial treatment with UBI (LUBI obviously differs somewhat but not in essence), the secondary emissions from the treated blood, and the ultra weak radiation normally emitted by cells in the form of biophotons are in the ultraviolet band of the spectrum, so in this sense UBI is "natural" not only because of its similarity to sunlight but also because of its similarity to the ultra weak radiation of the body cells. In a word, UBI is right at home in the microambience of the body in a way that no chemotherapy can ever be. In contrast to the barriers the cells might set up to block out chemotherapies perceived as somehow incorrect, they would readily accept their minuscule portion of UBI 's biophotons as a form of natural energy. Their cellular mechanisms could easily repair any damage such a tiny amount of secondary emissions might do; it is very unlikely that a few stray photons do much damage anyway. In turn, the cells' readiness to absorb some of the secondary biophotons would reduce the amount that might otherwise end up in the cells in Category B. In effect, the billions of cells in Category C act as an enormous ecological catchment basin.

The philosophically inclined might view UBI as a link between macrocosm and microcosm.

Then what happened to Knott's poor dogs?

Once the secondary emissions from UBI had destroyed all of the infectious organisms (Category A), the blood then channeled the still incoming energy in the direction of the cells in Category B, thereby overwhelming them and causing effects similar to those resulting from massive overdoses of various chemotherapies. The difference between such chemotherapies and UBI in the period before the total destruction of infectious organisms of Category A is that the drugs' deviation from the ideal forms of energy (glucose, ATP, UBI 's secondary biophotons) causes the blood's energy gradient to channel them less precisely and so they damage Category B cells from the very outset, especially if they are also rejected by the resting cells of Category C.

Implicit in this model is the assumption that the blood has an ecology in which the top predators (at first Category A, then Category B once Category A is destroyed) can lay claim to an exceptionally high proportion of the surplus energy in the blood, whether in the form of glucose or photons (Dillon (1994), p. 42). Another assumption is that pharmacokinetics (and within it the primordial question of specificity) is more important in explaining the action of certain drugs than is pharmacodynamics. How the concentrated impact of the secondary biophotons of UBI , once absorbed, destroys an activated T-cell is an interesting scientific question; but it is less important from the standpoint of the balance between therapeutic effect and damaging side effects than the question of how the energy is concentrated in that cell and not elsewhere in the first place.

Is there an underlying law of pharmacology that explains the kind of specificity observable in UBI ?

Yes, the Law of Energy Specificity: The more closely a substance resembles forms of energy and the greater the metabolic activity of cells and infectious agents, the higher the specificity with which the substance is channeled to and absorbed by them.

Why is specificity so important?

Because to say that a treatment has high specificity is tantamount to saying that it is effective and safe.

Why is determining the mechanism of action of UBI so important?

The main reason is that the identification of the mechanism of action of any therapy ranks second only to rigorous clinical trials with positive results in terms of giving physicians confidence in the effectiveness and safety of the therapy. The better one understands the mechanism of action of a therapy, moreover, the more confident one can be in predicting its likely effects when used in new circumstances.

How can such small treatment doses have such wide-reaching effects?

Blood cells contain various forms of energy and are highly reactive. The initial treatment triggers a release of energy from them in the form of secondary biophotons. The amount of secondary energy emitted might well exceed (or be less than) the level of energy initially received. Even the relatively low amount of ambient photons absorbed during the period that blood is removed from the body for purposes other than UBI is known to have a beneficial effect upon retransfusion. This effect is one cause of the overall benefit of UBI, though obviously not of LUBI. See Ganelina and Samoilova (1986), p. 22, listed at the beginning of the Bibliography.

How can the blood emit more energy than it receives?

The blood can be defined as a well-organized, energy-bearing fluid with the properties of a virtual resonant cavity (this characteristic arises from the sum of the effects in the blood cells, whose cellular walls make them resonant cavities, but the biophysical properties of the cellular field also play a role). In other words, the blood operates as a distinct system that, through a series of branching chain reactions, reacts in a nonlinear manner in response to inputs of energy (see Voeikov et al. (1997) and the references therein). UBI "turns the cells on" rather than simply "charging" them, though there is an element of charging. An important implication of this is that the parameters for the intensity of treatment of the blood in UBI may be quite wide because the treated blood sample will proceed to react according to its own principles and thus the secondary energy it emits might bear little relationship to the exact level of energy it receives. In turn, this phenomenon may explain why considerable variation in treatment intensity, duration and number of sessions, source, and intervals often does not seem significantly to affect the therapeutic result. It is true, however, that at times the dosages employed in clinical trials seem inadequate to the task.

The relationship between level of treatment and therapeutic outcome is a priority subject for UBI research. It is possible that the number of times the treatment is repeated is more important than the level of the dose; the signaling effect of the treatment may be more important than the charging one. Likewise, repeating the treatment on a daily basis may be more effective than doing so at greater intervals, either because in this way UBI mimics the periodicity of sunlight or because the initial activation of the cells does not fully subside and thus is taken to higher levels on subsequent days of treatment.

Is UBI uniformly effective against overwhelming infections and fulminating autoimmune conditions?

No. In some cases, the patient's condition has deteriorated beyond the help of UBI. In others, UBI simply is not effective. Still, no other therapeutic intervention appears to work nearly as well as UBI in such difficult indications.

Is UBI equally effective against all kinds of microorganisms?

UBI's action against fungal and protozoan diseases is not well characterized. There is one report of effective treatment of 6 out of 7 cases of inoculation malaria, of a single case of tertian clinical malaria, and of experimental malaria in a monkey (Miley (1997)). The higher the proportion and activation potential of DNA in a microorganism, the greater is its vulnerability to UBI (as well as to energy-mimicking drugs). Viruses are thus the easiest target for UBI's secondary emissions. It is almost as if there were an elective affinity between the viral DNA and the secondary biophotons. Then come various bacteria, fungi, and protozoa in a rank order that would become evident in response to therapy but difficult to validate according to relative DNA proportion and activation potential. Of course, UBI also activates the entire immune system, so it is not easy to sort out what proportion of its effects in infectious diseases derives from the mechanism of concentration according to the Law of Energy Specificity and what proportion results from its general stimulation of the immune system.

What explains UBI's variation in effect in a given disease?

The most important cause seems to be that, like other interventions, UBI is more effective during the early stages than it is after irreversible damage has occurred. Failure to take this into account has led to considerable confusion and disappointment. UBI probably retains its therapeutic effect farther into a disease's course than competing therapies, but one should not expect miracles. A second cause of variation in effect is that frequently UBI is not provided in sufficient dosage.

In what other areas of medicine might UBI be effective?

UBI is highly effective in the treatment of all kinds of pneumonia. It is remarkably efficacious in the treatment of other respiratory diseases as well, e.g., respiratory infections in cystic fibrosis.

UBI apparently has higher specificity than 2-chlorodeoxyadenosine (2-CdA/Cladribine), which has perhaps the highest specificity of any drug used in hematology. This might suggest that UBI could outperform 2-CdA in treating many leukemias, especially since the development of tumor-cell drug resistance would presumably be less likely with UBI. In fact, however, the occasional attempts to use UBI against hematological malignancies have been disappointing. Most UBI practitioners conclude that it is ineffective against solid tumors and hematological malignancies, though there are isolated reports of successes. In a telling incident, a physician treating an elderly woman for cancer discovered that UBI had little or no effect on her cancer but caused a plantar wart of 25 years' standing to disappear (Douglass (1996), pp. 139-50). UBI is a virus killer, not a tumor killer.

This case suggests, however, that UBI can reduce cancer rates by treating the viral diseases that give rise to various tumors. In the case of plantar warts, for instance, verruca plantaris is a human papilloma virus akin to the HPV of genital warts that has recently been implicated in the etiology of over 90 percent of cervical cancers. Unlike other antiviral agents, UBI has an action that does not depend on the precise fit between its chemical structure and the molecular arrangement of a given virus. Therefore, if it indeed is effective against one kind of HPV, it is very probably effective against another. Thus the antiviral property of UBI is of potential major interest in oncology.

When UBI is used on an ongoing basis, it does seem to have a prophylactic effect against the development of cancers like that of aspirin against colon cancer. Presumably its antimetabolic action retards or suppresses excessive growth of pre-tumor cells. This property might qualify UBI as a substitute for preventive surgery in apparently healthy women with a family history of breast and ovary cancer. On the analogy of ibuprofen, this effect might also be present in the prophylaxis of other conditions such as Alzheimer's. In contrast, UBI's results against Parkinson's disease have been disappointing, and its track record against multiple sclerosis is not as good as might be expected.

Photopheresis is in clinical trials as a suppressor of Graft Versus Host Disease and organ transplant rejection, which suggests that UBI may have the same indications. UBI is currently being used by a reputable American anesthesiologist to treat the refractory pain of chronic disease when all other treatments have failed. In both oncology and the treatment of pain, UBI's role as a kind of glucose and ATP antagonist/substitute/overrider that suppresses excessive metabolic activity of selected cells might explain its effectiveness.

UBI cannot reverse the effects of autoimmune diseases; but it can in some cases limit or stop their progress. In effect, UBI is a Disease-Modifying Antirheumatic Drug (DMARD). From the perspective of UBI, these autoimmune disorders are all the same disease. Some viral agent, toxin, or physical trauma has altered the cells in the affected region so as to make them appear strange to the immune system, which dispatches T-cells to orchestrate an immune response to them. UBI acts to suppress the excessive metabolic activity that this autoimmune response represents. In similar fashion, a recent Russian study suggests that LUBI is effective against metabolic disorders of genetic origin (reported at the November, 1996 International Laser Medicine Conference in Moscow). Thus UBI may be effective in limiting the progress of such disorders as multiple dystrophy, though it cannot reverse damage already done.

Russian researchers have reported excellent results with UBI in the treatment of neurological disorders. Berdichevskii and Dashkovskaia (1991), for instance, treated 90 patients aged 47-69 with atherosclerotic, hypertonic, and venous circulatory dysfunction refractory to other treatments or gaining only short remissions with them. There were 35 controls. 4-8 UBI treatments were given. Positive results were obtained with 87 percent of patients, including a full resolution of 51.2 percent of the neurological symptoms of the 37 atherosclerotic patients. UBI treatment caused the disappearance or significant decrease of headaches, dizziness, tinnitus, feeling of heaviness in the head, pain in the heart region, etc. Sleep was normalized as well. In most positive cases, the results were long lasting or permanent.

UBI Therapy can be used as a substitute for topical or systemic glucocorticoids in the treatment of uveitis and other indications in ophthalmology. Evidence regarding its effectiveness as a treatment for anemia is mixed, probably depending on the kind of anemia in question. In contrast, its powerful action in the

treatment of circulatory blockages in the legs can prevent gangrene and thus obviate the need for amputations. It also appears to work very well as a means of speeding wound healing--probably better than local low-intensity laser therapy.

Aside from UBI 's therapeutic action, in certain cases of difficult differential diagnosis a patient's response to it may be of diagnostic significance. More generally, the responses of various syndromes to UBI may help to identify their underlying mechanisms of action and so are of significance for research.

In a similar fashion, the clinical use of UBI can clarify the mechanism of action of other therapies. For instance, LUBI 's effectiveness against schizophrenia with depressive syndrome is clearly attributable to its ability to unblock microcirculation in the brain by destroying activated white blood cells and platelets. This finding may provide the answer to the old riddle of the mechanism of action of Electroconvulsive Therapy: ECT may have exactly the same effect on white blood cells and platelets. In turn, this suggests that UBI is both safer and more effective than ECT and that it can successfully treat certain patients resistant to ECT. This conclusion can be drawn from Kutko et al. (1992). Some of the patients in this trial had previously failed ECT, but the researchers do not make it clear whether these patients were among those subsequently successfully treated or not. Another tentative conclusion that can be drawn from the use of UBI in this and other neurological indications is that various disorders of which the mechanism has hitherto been disputed can now be shown to be caused by microcirculatory blockages.

In an even broader sense, UBI 's role as an antagonist/substitute/overrider of glucose and ATP endows it with unusual scientific interest in terms of affording insight into the body's energy metabolism. The dynamics of the process by which the treated cells emit secondary biophotons as well as the ways in which these biophotons are absorbed throughout the body, for instance, can shed light on fundamental cellular mechanisms and phenomena such as biophotonic radiation.

So UBI is of scientific interest?

Definitely. Among other things, there is evidence that in UBI certain phenomena occur that are not accounted for by the standard laws of photochemistry. For instance, various kinds of light appear to affect cells even at wavelengths at which they are not absorbed. This might be explained by some kind of field effect or by subtle interactions (resonance energy transfer, branching chain reactions?) at the level of ultraweak biophotonic radiation. A study of UBI 's action might shed light on the nature of the "communications phenomenon" whereby cells are thought by some researchers to signal to each other by means of patterns of biophotonic radiation. Likewise, demonstrably safe and effective doses for LUBI in clinical practice can differ considerably from prescribed norms.

The main underlying mechanism of action of systemic magnet therapy (action-at-a-distance) appears to be related to that of UBI as discussed in this Website. In certain circumstances, electrotherapy and acupuncture may also act in this manner, though this is a subject that deserves extensive investigation.

In effect, UBI is a form of biophysical pharmacology that exploits the chemiluminescent property of the blood cells for medicinal purposes.

UBI sounds a bit like certain therapies that are promoted by quacks, doesn't it? So it is acceptable to be skeptical?

Perhaps initially, but it is a mistake not to investigate further. Regarding UBI 's safety, one helpful approach is to keep in mind the magisterial dictum of Paracelsus: "All things are poison, and nothing is without poison. It is the dose alone that makes a thing not a poison." From this perspective, even the most appealing and non-intrusive form of natural medicine can be a poison if it is employed to excess or in improper circumstances. One could do serious damage to a patient with a massive overdose of UBI , just as one could with a massive overdose of Prozac, aspirin, or any other drug or natural remedy on the market. But with the right dose of UBI , one can bring back to good health a patient with one foot in the grave (Olney (1946), p. 235). In fact, the exceptional specificity of UBI appears to give it a very wide range of therapeutic benefit, making it potentially safer than many or all competing therapies.

In addition to the very clear, consistent pattern of effectiveness reported in studies by scores of researchers in different countries at different times, there is striking internal evidence that shows how trustworthy the

sources and information are. For instance, the forbearance of Knott and his medical collaborators in waiting five years after the initial highly successful treatment in 1928 in order to observe the first patient before treating a second one was a remarkable example of scientific probity. These were serious, ethical scientists.

Another telling piece of internal evidence is the consistency of the results of the Vladivostok bronchial asthma trials. In four trials in a row involving many hundreds of patients, UBI repeatedly outperformed LUBI in exactly the same way. In a fifth, on patients with chronic bronchitis, the results of UBI and LUBI were virtually equivalent; but the researchers had deliberately assigned the more severe cases to the UBI group, so that this result in fact confirmed those of the bronchial asthma trials. In other words, the finding that UBI is somewhat more effective than LUBI is very robust, the more so because the researchers made it clear at the outset that they would much prefer to use LUBI exclusively for several reasons.

To voice skepticism about findings of such power is a clear mark of bias. Once one accepts that one version of a therapy is more effective than another, however, it would be somewhat paradoxical to turn around and voice skepticism about the therapy's effectiveness in general.

Although Knott's initial results in the dog experiments should have made it clear that UBI is no mere placebo, certain critics persist in attributing its effects to psychological causes. American, German, and Russian researchers have, however, repeatedly studied this question in clinical trials. They have consistently found that a placebo-like effect occurs frequently but that even when it does UBI's physiological action indisputably surpasses placebo. UBI's effectiveness with animals and infants likewise demonstrates that it is no mere placebo.

In circumstances where it is easy for critics to indulge in unbridled skepticism (the Russians make a tempting target for endless aspersions as does the superficial resemblance UBI bears to therapies promoted by quacks), it is essential to put the critics themselves at risk. One difficulty in doing so is that many of them appear to have no incentive whatsoever to avoid a Type 2 error, a false negative conclusion that would lead them to dismiss a very promising therapy. This phenomenon can perhaps most accurately be termed "irresponsible skepticism." It is difficult to combat because this skepticism presents itself as deriving from a scientific perspective.

The curious reality is that UBI has no serious critics. A serious critic would read widely in the UBI medical literature, carefully study the photobiological and pharmacological mechanisms of UBI, consult extensively with UBI practitioners, and conduct well-conceived and objective clinical trials. Nor do there appear to be any serious criticisms of UBI, i.e., criticisms that are based on in-depth knowledge and evidence.

How can one best investigate further?

The UBI Bibliography contains many pertinent articles. Another source is the U.S. National Library of Medicine's Grateful Med, which contains citations and abstracts on the latest clinical results obtained by Russian and Ukrainian experts, who are far ahead of the rest of the world in the clinical use of UBI. The track record of Photopheresis can offer further insight. One approach might be to consider the lack of effectiveness of other therapies and the collateral damage they cause, then to give thought to whether UBI might be a more fitting treatment for the indications in question. No therapy should be judged in a vacuum or according to impossible standards of perfection. Only by comparing various therapies according to several practical criteria, including cost, can one make optimal judgments.

Thus the question "Does UBI work?" is not a useful one because it fails to place the therapy in a context. In a sense, all therapies "work." One could speak of a Principle of Therapeutic Correspondence: Every source of energy has a corresponding therapeutic range. The proper questions with UBI, LUBI, or any other medicinal or biophysical therapy are: "What is its therapeutic range? What are the circumstances in which it is appropriate to use, and what effects does it obtain in those circumstances? How does it compare to other therapies? What are the counter-indications?"

Similarly, the question "Is it safe?" is not helpful. It can lead to a bottomless pit of doubt whereby every piece of evidence of the safe application of UBI is met with the further question: "But isn't it possible that UBI causes some hidden, systematic damage?" That approach is ultimately paranoid. The correct scientific questions are: "What are the level and pattern of UBI's toxicity? How do they compare with those of competing therapies?" In fact, these are simply other ways of framing the above questions on effectiveness.

Are any practitioners in the United States currently using the UBI device?

Some 150 practitioners in the United States are using it. Thousands of Russian and Ukrainian physicians regularly use UBI and LUBI, as do some of their German colleagues.

How expensive is UBI treatment?

At present devices cost between \$3,000 and \$ 5,000 USD. Costing out the price of the device over thousands of uses and making a rough estimate of the cost of accessories is \$ 45. If each treatment requires about 45 - 60 minutes of set-up, treatment, and clean-up by one nurse or medical assistant @ \$40 per hour, then the total cost would be \$85. Adding \$40 for administrative expenses would bring the total to \$125. Circumstances such as varying wages could cause this estimate to vary considerably, especially in low-wage countries. The device would ordinarily pay back the purchase price within a year. If unpaid reduced hospital stays are considered the pay payback would be substantial.

Are there any other pertinent cost-related considerations?

Yes. Russian researchers repeatedly report significant reductions in the length and frequency of hospital stays because UBI is more effective than competing chemotherapies in many indications. In addition, many patients with debilitating diseases that have made them invalids are able to return to work following UBI . Timely intervention with UBI can also save on the expense of operations such as amputations of diseased legs in diabetes.

Is there any danger that the UBI device will transmit disease from one patient to the next?

All materials, the needles, cuvettes and tubing are disposable. With LUBI , needles should be disposed and waveguides not shared among patients. One danger with both UBI and LUBI in poor countries is that some practitioners will be tempted to reuse disposable cuvettes and waveguides.

There must be some drawbacks to UBI ?

Careful study by the Israeli Center for Bio-Energetic Therapy, Ltd. has revealed two drawbacks.

First, as with all drugs (for although UBI is light therapy, it has many of the characteristics of a bloodborne drug), it is important to provide the right dosage. Too little will not have effect; too much could do damage. This is not too difficult with LUBI , but with UBI the problem is one of establishing objective measures for treatment. Thus far no researcher or practitioner has developed a way to measure the optimal wavelength, duration, or intensity of treatment, or the optimal amount of blood treatment. For this reason, Knott and his medical colleagues preferred to use modest doses and to repeat the treatment after an interval during which they could observe the patient. They established guidelines for dosage and intervals, but a considerable latitude remains for the practitioner's judgment. This characteristic of UBI makes it almost impossible to define what an optimal dose might be. It has, however, the benefit of obliging practitioners to individualize therapy and thus to avoid the problems that can arise from excessive adherence to protocols. The lack of observable side effects from UBI also suggests that even in the case of overshooting somewhat during an individual session of UBI , the damage is vanishingly small. Such overshooting can occur in chemotherapy administered according to protocol as well and can do considerable damage.

In other words, an excessive pursuit of precision is the enemy of efficacy in UBI therapy. In their understandable desire to attain precision and ease of use, many Russian practitioners abandoned UBI in favor of LUBI . But now it is clear that in doing so they chose the second best approach (though LUBI is certainly very good medicine). UBI requires the practitioner to recognize that medicine calls for more than mere technical skill; it has an inescapable element of judgment and art to it as well.

A second drawback of UBI is that in certain indications, for reasons that are not entirely clear, patients' responses to UBI are not as uniform as might be expected. For instance, a rigorous Ukrainian clinical trial of LUBI in rheumatoid arthritis (Zverova et al. (1994)) found that treatment actually exacerbated the worst cases, presumably where irreparable joint damage had already occurred, perhaps by provoking the immune system to react even more strongly. In contrast, LUBI was consistently very beneficial for patients with milder and moderate arthritis of shorter duration. A careful comparative study might reveal that the limits of

UBI in severe cases of rheumatoid arthritis closely parallel the known limits of methotrexate, the current standard treatment.

Any other problems?

An obvious initial limitation to the use of UBI is the patchy, anecdotal evidentiary basis for its application in specific indications. While there is a good deal of evidence in the medical literature of the 1940s of UBI 's striking effectiveness in the treatment of viral infections (Miley and Christensen (1948)), for example, any statement regarding its use for such a special indication as HIV must be taken with caution. In fact, various physicians in the United States have used UBI to treat HIV. They are said to have achieved destruction of all evidence of virus in the blood, but none of this has been reported in a scientific manner and so it is warranted to withhold judgment. The FDA recently seized UBI devices that were being used to treat HIV on the grounds that this was not an indication at the time the device was accorded legal status in 1976. In Russia some physicians consider HIV a counter indication for UBI because the minor damage UBI can cause to the membranes of T-4 cells makes them more vulnerable to subsequent infection by HIV. But this opinion is very much open to question. A recent Russian study of the treatment of 8 HIV patients with transdermal LUBI at 980 nm reportedly resulted in improved status for all 8, but it lacked the rigor to be more than suggestive (Ovsiannikov (1997)).

In Israeli Center for Bio-Energetic Therapy, Ltd.'s judgment, UBI is very likely somewhat more effective than the current 3-drug combinations in destroying HIV, while it is much less toxic and far less expensive. UBI 's treatment regime is also much simpler. There is no evidence regarding the potential for HIV to develop resistance to UBI . Much evidence suggests that UBI is also more effective than any other therapy of HIV/AIDS in the treatment of accompanying pneumonia and hepatitis. UBI may also be highly effective in preventing in utero or perinatal transmission of HIV and acceptably effective as maintenance therapy following other treatments. Photoactive drugs must be excluded while treating HIV with UBI , however, in order to avoid harmful interactions, so this must be taken into account in treating concomitant disorders.

Curiously, not a single full clinical trial of UBI for HIV has been organized. It is possible that early on AIDS researchers rejected it on the basis of in vitro tests, which are highly misleading in regard to a therapy like UBI .

In contrast to the situation in bacterial diseases, where antibiotics became fully competitive with UBI , there has never been a chemotherapy that has nearly the range and effectiveness UBI appears to have in inactivating or destroying viruses. It is clearly superior to Acyclovir, the gold standard of antiviral therapy, for the treatment of viruses other than herpes simplex virus. Because the antiviral action of UBI does not depend on the molecular configuration of an individual virus, UBI can far more readily handle mutant strains that otherwise might lead to resistance. From the perspective of UBI , all viruses present approximately the same target, though differences in levels of viral resistance to UV in vitro suggest that the question of potential viral resistance to UBI in vivo will require careful study.

Haven't studies shown that ultraviolet activates HIV?

Yes, but the researchers in one of the best of such studies acknowledged that this was a question of dose, and that even at the low dose that activated HIV 10-50 percent of viral DNA was destroyed. When the dose is raised to a therapeutic level, 100 percent of viral DNA is destroyed. In fact, it is the very activation of viral DNA by UBI that makes the virus more vulnerable to destruction. What seems to happen is that the cell in which the virus is an obligate parasite responds to the initial incoming biophotons by boosting its own metabolic activity. Then the viral DNA in turn responds to the cell's activation by activating itself, thereby exposing it to the full brunt of the increasing amounts of incoming biophotons. Read from this perspective, these studies provide a vivid depiction of what happens in the first moments when the secondary biophotons of UBI come into contact with the virus (see Zmudzka and Beer (1990)). In the terms of the earlier analysis, as the top predator within the body's ecological system, the viral DNA lays claim to an inordinate share of the free energy, i.e., of the secondary biophotons from UBI .

Does UBI have any advantages over competing chemotherapies?

Yes, ten advantages:

- 1) UBI has higher specificity than nucleoside analogues and certain other chemotherapies;
- 2) UBI is less likely to induce drug resistance in microorganisms. The secondary emissions of UBI have more uniformly destructive effects on microorganisms than chemotherapies, which some microorganisms may reject or ingest and develop resistance to. For a virus to develop resistance to UBI 's concentrated biophotons, it would have to evolve into something quite different: not impossible, but certainly not an easy task. Certain parasites, however, might not be vulnerable to therapeutic doses of UBI not because they have developed resistance through treatment with it but because they are resistant to start with, perhaps because of an ability to freeze their metabolic processes;
- 3) Unlike antibiotics, UBI does not destroy benign flora, does not depress the immune defenses of the body, only occasionally gives rise to allergic reactions, and has no toxic effects on specific organs;
- 4) In acute infectious diseases of unknown etiology, UBI can immediately be employed, obviating the need to wait for tests or hope that an antibiotic used before test results are available will be appropriate;
- 5) Because UBI is so versatile, a physician can become a master at its use for many purposes, thereby saving on the time required to learn the details of many drugs for specific indications as well as avoiding the possibility of making an error in using a new drug;
- 6) Storage, spoilage, expiration, and similar supply and distribution problems are reduced in UBI ;
- 7) The problem of compliance with UBI is much smaller than with chemotherapies, in turn lessening the likelihood of the development of resistance and spread of infectious diseases;
- 8) Except in odd circumstances, accidental or deliberate overdoses by patients are impossible with UBI . An experienced practitioner is in control of the device and its use at all times;
- 9) UBI is cheaper than many chemotherapies;
- 10) In addition to destroying microorganisms through its specific action, UBI boosts the overall immunological defenses of the body through its non-specific action, unlike chemotherapies. While the handiness and precise dosages of antibiotics make them better than UBI for some specific indications, in major indications such as pre- and postoperative prophylaxis, UBI is superior.

How does UBI compare with other therapies such as surgery and natural medicine?

UBI is less expensive, damaging, and invasive than surgery, while it can perform dramatically in acute conditions for which most kinds of natural medicine are not suited. In effect, UBI shares certain characteristics with both mainline and alternative therapies. UBI is like mainline therapies in that its mechanism of action is understood (at least by visitors to this Website!) and closely parallels that of drugs; it is in use among reputable physicians; it has been administered to millions of patients without any evidence of systematic negative side effects; it has been extensively reported in the medical literature; and the UBI device has legal regulatory status. UBI is like alternative therapies in that in the United States only a few physicians use it; there is widespread ignorance and consequent unwarranted skepticism in regard to it; i.e. there were only a few old clinical trials; and UBI has the allure of a natural therapy because UV is associated with sunlight.

So UBI is a panacea of sorts?

No. In some disorders UBI 's effectiveness is known to be limited. In other cases, e.g., ulcers, effective and relatively inexpensive treatments already exist, so there is little need even to investigate using UBI --except as an option in a remote, impoverished region where modern medicines are hard to come by. In others, such as sinusitis, the results with UBI appear to be good enough to make it worth trying in a given refractory case but not good enough to recommend as a standard treatment.

One way to think about it is this: for what indications is UBI the treatment of choice? From this perspective, UBI is indeed unusual. No other therapy can match the range of difficult conditions for which UBI is the clear or potential treatment of choice. Its mechanisms of action and therapeutic profile are well characterized. As a photobiological and immunological treatment, UBI Therapy is inherently attractive.

A Note regarding renaming UBI to Bio-Photonic Therapy:

UBI has been termed Photopheresis, Hematogenic Oxidation Therapy, Quantum Hemotherapy, autotransfusion of UV-Irradiated Blood, and photoluminescence. Its main designation, however, has been Ultraviolet Blood Irradiation therapy. That is a scientifically accurate name given to UBI by the American pioneers. As explained above, they were exemplary scientists and medical doctors. Unfortunately, they were extremely deficient in terms of marketing skills, a weakness that they themselves recognized. As a result, they saddled this wonderful therapy with a name that has predictably and effectively stigmatized it for 70 years.

"Ultraviolet" is suspect because it is invisible and thus somewhat mysterious. It can be associated with x-rays, with their known harmful effects. And in recent years it has been implicated in the etiology of skin cancer, though this is clearly a question of dose.

Much worse, "Irradiation" has an enormously suggestive negative image, though again the dose determines whether it is beneficial or harmful. Such is the power of this image that even expert scientists and medical researchers well aware of the concept of dose often have misunderstood or dismissed UBI. A good deal of the failure of UBI to gain widespread acceptance arises from the amazingly negative suggestiveness of its original name.

For this reason, Israeli Center for Bio-Energetic Therapy, Ltd. has, in consultation with various specialists and interested lay persons, selected the name Bio-Photonic Therapy to replace the old designation. Bio-Photonic Therapy is scientifically accurate in that it identifies the central mechanism of action of the therapy. In fact, it is more accurate than the old designation in that it emphasizes the in vivo nature of the therapy. It also more correctly conveys an image of benign, natural self-healing that is highly characteristic of Bio-Photonic Therapy. Bio-Photonic Therapy readily translates into many languages. It is connected to Biophotonic Diagnostics, as practiced with the use of photon counters. Bio-Photonic Therapy and Biophotonic Diagnostics can together be viewed as constituting Biophotonic Medicine. Above all, the name Bio-Photonic Therapy enables this excellent therapy to be evaluated on its own merits without having to overcome a negative image before people will even consider it.

The leading scientific study of UBI is I.E. Ganilina and K.A. Samoilova, eds. *Mekhanizmy vliianiia oblucheniia ul'trafioletovymi luchami krovi na organizm cheloveka i zivotnykh* (Mechanisms of the Influence of Blood Irradiated with Ultraviolet Rays on the Organisms of Humans and Animals). Leningrad: Nauka, 1986. Other books on UBI have been published in Sverdlovsk and Vladivostok. Books on laser medicine that contain information on LUBI have been published in Izhevsk, Khabarovsk, Kiev, L'vov, Minsk, Moscow, Novosibirsk, Obninsk, Saratov, Tashkent, and Vladivostok.

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