

W/LGTH	ASSOCIATED HEALTH BENEFIT	RESEARCH CITATION
Near	<p><u>Cell Health / Immunity</u> <i>CELL HEALTH:</i> NASA studies taken from the American Institute of Physics showed that delivering nIR deep into body tissue, LEDs can quadruple cell health & tissue growth. NASA developed these LEDs as an alternative to lasers for use in plant growth experiments. They're now used in military & astronaut field missions where medical care is limited. Diabetics are also seeing improvement in feet & calf wounds. <i>IMMUNITY:</i> Several studies done by Laser/Surgical Medical Centers in the '90s showed LEDs stimulate white blood cell production & collagen growth by increasing energy at a cellular level.</p> <p>A study done at the Medical College of Wisconsin demonstrated LED-produced NIR helped promote cell health & regeneration. The LEDs in our <i>Solocarbon Custom Spectrum</i> heaters produce NIR in the same range as those in this study. [Note - while not the study's focus, the rationale for using LEDs vs. lasers is the greater benefit to treat wounds from LEDs than lasers due to their ability to impact larger areas and with no potential for thermal injury since there is virtually no heat generated by LEDs.]</p>	<p>Harry T. Whelan, Ellen V. Buchmann, Noel T. Whelan, Scott G. Turner, Vita Cevenini, Helen Stinson, Ron Ignatius, Todd Martin, Joan Cwiklinski, Glenn A. Meyer, Brian Hodgson Lisa Gould, Mary Kane, Gina Chen , James Caviness. <i>NASA Light Emitting Diode Medical Applications From Deep Space to Deep Sea</i> . CP552, Space Technology and Applications International Forum-2001, edited by M. S. El-Genk. Copyright 2001 American Institute of Physics 1-56396-980-7/01.</p> <p>Margaret T.T.Wong-Riley, Huan Ling Liang, Janis T. Eells, Britton Chance, Michele M. Henry, Ellen Buchmann, Mary Kane, and Harry T. Whelan. <i>Photobiomodulation Directly Benefits Primary Neurons Functionally Inactivated by Toxins: Role of Cytochrome C Oxidase</i>. JBC Papers in Press. Published on November 22, 2004 as Manuscript M409650200. Copyright 2004 by The American Society for Biochemistry and Molecular Biology, Inc.</p>
Near	<p><u>Wound Healing</u> nIR LED application stimulates & accelerates cell and tissue repair to aid in the treatment of numerous diseases (linked to mitochondrial dysfunction--including, but not limited to aged related eye degeneration, Parkinson's and Alzheimer's disease).</p> <p>A 2001 report published in <i>The Journal of Clinical Laser Medicine and Surgery</i> showed nIR produced from LED technology was successful in promoting cell regeneration for faster wound healing. The test subjects included military personnel operating in the field (where medical facilities are not available) and cancer patients who used the technique to recover faster from some of the side effects brought about by chemotherapy treatment.</p>	<p>Kristina A. Desmet, B.S., David A. Paz, B.S., Jesse J. Corry, M.D., Janis T. Eells, Ph.D., Margaret T.T. Wong-Riley, Ph.D., Michele M. Henry, B.S., Ellen V. Buchman, B.S., Mary P. Connelly, B.S., Julia V. Dovi, Ph.D., Huan Ling Liang, M.D., Diane S. Henshel, Ph. D., Ronnie L Yeager, M.S., Deborah S. Millsap, M.S., Jinhwan Lim, M.S., Lisa J. Gould, M.D., Ph.D., Rina Das, Ph.D., Marti Jett, Ph.D., Brian D. Hodgson, D.D.S., David Margolis, M.D., and Harry T. Whelan, M.D. <i>Clinical and Experimental Applications of NIR-LED Photobiomodulation</i>. Photomedicine and Laser Surgery Volume 24, Number 2, 2006 © Mary Ann Liebert, Inc. pp. 121–128.</p> <p>Whelan et al; <i>Effect of NASA Light Emitting Diode Irradiation and Wound Healing</i>. Journal of Clinical Laser Medicine & Surgery, Volume 19, Number 6, 2001, Mary Ann Liebert, Inc, pp. 305-314.</p>
Near	<p><u>Skin Rejuvenation</u> In 2005, a study published in <i>The Journal of Cosmetic and Laser Therapy</i> showed that exposure to nIR from LEDs over the course of 12 weeks resulted in statistically significant skin rejuvenation. Participants experienced reduction of wrinkles & crow's feet, as well as improved overall skin tone, including softness, smoothness, elasticity and firmness.</p>	<p>B.A. Russell, N. Kellett & L.R. Reilly. <i>Study to Determine the Efficacy of Combination LED Light Therapy (633nm and 830 nm) in Facial Skin Rejuvenation</i>. Journal of Cosmetic and Laser Therapy, 2005; 7: pp 196-200.</p>

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Near/Mi	<p><u>Pain Relief</u></p> <p>Over more than a decade since the '90s, NASA has been studying solutions to address the fact that healing is more difficult in space. Studies have concluded optimal LED technology providing nIR wavelengths allow deep penetration of tissue by increasing cell growth from the inside. Studies were performed on people with positive results for reducing brain tumors, recovery from surgeries and open sores from disease or injuries. These studies also determined that LED treatments are a more time & cost-effective alternative to laser treatments.</p> <p>A 2003 study conducted by the Department of Dermatology and Institute of Medical Research using low-intensity nIR laser (LIL) irradiation showed positive results addressing inflammation. Usage of nIR (LIL) was shown to aid in the production of lymphocytes (white blood cells) which alleviate inflammation & reduce swelling, two factors in easing bodily pain.</p>	<p>Whelan et al; <i>The NASA Light-Emitting Diode Medical Program-Progress in Space Flight and Terrestrial Applications</i>. CP504, Space Technology and Applications International Forum-2000, edited by M. S. El-Genk. Copyright 2000 American Institute of Physics I-56396-9 19-X/00.</p> <p>Lidija Kandolf-Sekulovic, Milena Kataranovski, Milos D. Pavlovic. <i>Immunomodulatory Effects of Low-Intensity Near-Infrared Laser Irradiation on Contact Hypersensitivity Reaction</i>. <i>Photodermatol Photoimmunol Photomed</i> 2003; 19: pp 203–212, Blackwell Munksgaard.</p>

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Mid	<p><u>Improved Circulation</u> mIR therapy was shown to stimulate blood flow significantly after a 45 minute session, and could be sustained for up to 60 minutes (this pertains particularly when microcirculation problems are present). Effects of the treatment occur soon <i>after</i> the session takes place. NOTE - The study refers to the mIR wavelength as fIR, but based on consensus definition, this is actually mIR].</p>	<p>Shi- Yau Yu, Jen- Hwey Chiu, Shiaw-Der Yang, Yu-Chen Hsu, Wing- Yiu Lui , Chew- Wun Wu. <i>Biological Effect of Infrared Therapy on Increasing Skin Microcirculation in Rats</i>. <i>Photodermatol Photoimmunol Photomed</i> 2006; 22: pp 78–86.</p>
Mid/Far	<p><u>Weight Loss</u> In a 2009 study (using a Sunlighten Solo), Dr. Beever determined that infrared sauna use is beneficial in reducing weight and waist circumference. The cardiovascular demand imparted by thermoregulatory homeostasis is similar to that achieved by walking at a moderate pace. He concluded that infrared sauna therapy might be of particular benefit to those who are sedentary due to various medical conditions like osteoarthritis, or cardiovascular or respiratory problems.</p> <p>In 2001, the <i>Journal of American College of Cardiology</i> reported that after a two week period of use, infrared sauna treatments significantly reduced body weight. As calculated by the amount of increase in heart rate, a 30-minute infrared sauna session can burn upwards of 600 calories.</p> <p>According to the <i>Journal of the American Medical Association</i> (Aug 1981), "Many of us who run do so to place a demand on our cardiovascular system, not to build leg muscles. Regular use of a sauna imparts a similar stress on the cardiovascular system, and its regular use may be as effective as a means of cardiovascular conditioning & burning of calories as r</p>	<p>Dr. Richard Beever BSc,MD,CCFP. <i>Do Far-Infrared Saunas have Measurable Health Benefits? A Sequential Longitudinal Interrupted Time Series Design Study</i>. 2009 - Not Yet Published.</p> <p>Dr. Masakazu Imamura, MD, et al. <i>Repeated Thermal Therapy Improves Impaired Vascular Endothelial Function in Patients With Coronary Risk Factors</i>. Vol. 38, No. 4, 2001. <i>Journal of American College of Cardiology</i>: pp 1083-1088.</p> <p>We do not currently have a copy of the August 1981 edition of the <i>Journal of the American Medical Association</i>.</p>

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Far	<p><u>Detoxification</u> In 2007 at the Taipei Veterans General Hospital, Dr. Chih-Ching Lin found that FIR therapy increased the efficiency of blood flow & created easier access for surgically created connections between arteries & veins in dialysis patients. In other words, FIR improved the overall detoxification experienced by these patients.</p>	<p>Chih-Ching Lin, Chao-Fu Chang, Ming-Yu Lai, Tzen-Wen Chen, Pui-Ching Lee and Wu-Chang Yang. <i>Far-Infrared Therapy: A Novel Treatment to Improve Access Blood Flow and Unassisted Patency of Arteriovenous Fistula in Hemodialysis Patients</i>. Received May 27, 2006. Accepted December 11, 2006. Copyright © 2007 by The American Society of Nephrology: pp 985-992.</p>
Far	<p><u>Blood Pressure Reduction</u> In 2005, Solocarbon heaters were used in a study at the University of Missouri Kansas City. The participants used an infrared sauna three times per week for 30 minutes over a six week period. The results showed significantly significant improvements in both diastolic and systolic blood pressure.</p>	<p>Becky Edwards, M.D., Heather Kort D.O, Faculty Staff Advisor: Dr. John Foxworth, PharmD. <i>A Study of the Health Benefits of Far Infrared Sauna Therapy</i> - Conducted by the University of Missouri, Kansas City, 2005.</p>
Far	<p><u>Relaxation</u> While there hasn't yet been a quantifiable study on the relaxation benefits of infrared therapy, it has long been known from qualitative feedback that far infrared sauna sessions induce a relaxed state. Sunlighten offers the ability to reach an even deeper state of relaxation with industry-exclusive SO Sound Vibrational (Acoustic Resonance) Therapy.</p>	<p>Based on qualitative consumer feedback, no quantitative studies at this time.</p>