



Fit Bodywrap® for Wellness

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About the Author

Dr. Aaron Flickstein's 1994 research paper entitled "Infrared Thermal System for Whole Body Regenerative Radiant Therapy" stands as one of the most frequently quoted sources on the therapeutic uses of FIR. He has also earned praise from Deepak Chopra regarding his pioneering approach to wellness, "Congratulations to Dr. Aaron Flickstein for developing a unique system utilizing the domain of Universal Intelligence for our healing and wellbeing." In addition to developing instructional radio, video and cable TV programming with a focus on wellness, Dr. Flickstein continues to operate a chiropractic practice in Minnesota, where the use of the FIT Bodywrap® system aids his patients in overcoming chronic pain and other disorders.

Wellness and Fit Bodywrap Infrared Therapy: A Summary

Extensive clinical research has documented a wide range of observations of the potential wellness benefits of infrared therapy as delivered by the Fit Bodywrap System. This paper details research, observations and potential benefits of using the Fit Bodywrap System in a wide range of applications in addition to weight loss, including pain relief, detoxification, stress management, anti-aging, high blood pressure, cardiovascular improvements and many more.

Research highlights:

- Chronic pain patients experienced a significant reduction in pain levels (nearly 70%) after the first session of infrared therapy.
- NASA concluded in the 1980's, that far infrared stimulation of cardiovascular function is the ideal way to maintain cardiovascular conditioning in astronauts involved in long space flights.
- Blood flow increases from 5-7 quarts up to 13 quarts a minute.
- Immersive infrared use is reported to generate sweats containing 15-20 percent toxins compared to only 3-5 percent in traditional saunas or through regular exercise.
- Far Infrared heat strengthens the cardiovascular system by causing heart rate and cardiac output increases, and diastolic blood pressure decreases.
- Passively experiencing immersion in infrared radiation gives you similar results as from workout regimes that increase blood flow to vital organs and muscles.

Benefits of Far-infrared immersion as delivered by the Fit Bodywrap system.

Extensive clinical research has produced a large body of observations on the potential beneficial effects of infrared therapy. Infrared therapy as delivered by the Fit Bodywrap has demonstrated success in resolving or safely managing a broad range of disorders as well as promoting processes that lead to well-being including:

- 1) Dramatic relief for rheumatoid, gouty and degenerative arthritis
- 2) Accelerating recovery from acute and chronic soft tissue injuries in ligaments, tendons, fascia and muscles
- 3) Fibromyalgia
- 4) Carpal Tunnel Syndrome
- 5) Complex Regional Pain and Raynaud's Phenomenon
- 6) Spinal Cord shock
- 7) Post-Concussion Syndrome
- 8) Fat reduction and weight loss
- 9) Detoxification
- 10) Cortisol reduction from stress overloading
- 11) Relaxation and Sleep normalization
- 12) Lowering elevated blood pressure
- 13) Anti-aging effect on skin and other tissues
- 14) Skin purification
- 15) Improved blood circulation
- 16) Cardiovascular conditioning without joint stress
- 17) Wound healing.
- 18) Dialysis
- 19) Hyperthermia to raise core temps to make life tough for cancer cells
- 20) Direct Immune System boosting due to core temperature rise

Far-infrared or radiant heat (FIR)

Far-infrared or radiant heat (FIR) is part of the spectrum of frequencies/colors found in sunlight. It is a safe form of energy that heats objects by a process called direct light conversion. Radiant infrared heat warms the objects around it without affecting the temperature of the surrounding free air. All warm-blooded animals emit far infrared/radiant heat, a beneficial and essential form of energy that has the ability to penetrate, refract, radiate and reflect. The main source of IR radiation on earth is the sun. It emits 54% of its output as infrared (IR) radiation. Infrared radiation from our sun is further divided into:

- 1) ***IRA*** (near IR),
- 2) ***IRB*** (mid IR) and
- 3) ***IRC*** (far IR or ***FIR*** as from the Fit Bodywrap)

Artificial IR sources are constantly gaining importance. They emit primarily in the 5-15 micron length of the far infrared band of light, closely paralleling our atmosphere's IR window that allows through the sun's infrared output in the 7-14 micron band.

Warmer is better

A low body temperature has been shown to contribute to many health problems, such as:

fatigue, headaches, migraines, PMS, easy weight gain, depression, irritability, fluid retention, anxiety and panic attacks, hair loss, poor memory, poor concentration, low sex drive, unhealthy nails, dry skin and hair, cold intolerance, heat intolerance, low motivation, low ambition, insomnia, allergies, acne, carpal tunnel syndrome, asthma, odd swallowing sensations, constipation, irritable bowel syndrome, muscle and joint aches, slow healing, sweating abnormalities, Raynaud's Phenomenon, itchiness, irregular periods, easy bruising, ringing of the ears, flushing, bad breath, dry eyes/ blurred vision, and more.

Infrared based therapeutic devices have been used for a variety of conditions for a number of years, including :

- 3) rheumatoid arthritis and
- 4) in photodynamic therapy
- 5) as well as fat reduction and weight loss,
- 6) detoxification,
- 7) relaxation,
- 8) pain relief,
- 9) lowering blood pressure,
- 10) anti-aging and
- 11) skin purification,
- 12) improved blood flow and circulation,
- 13) cellular health, and
- 14) wound healing.

The Fit Bodywrap brings a unique combination of effectiveness and comfort to the therapeutic application of FIR, and is being used in many research-supported applications.

Why doctors and therapists love IR

Far infrared is used by medical doctors, chiropractors, physical and massage therapists and acupuncturists in the treatment of:

- 1) *arthritis,*
- 2) *joint pain,*
- 3) *stiff muscles, and*
- 4) *injuries to tendons and ligaments.*

Far infrared heat from the Fit Bodywrap is beneficial to people in many ways:

1. FIR heat *expands capillaries*, stimulating increased blood flow, and *aiding in regeneration*, improved circulation and oxygenation.
2. Far infrared heat *speeds cellular metabolic rates* by stimulating the activity of *mitochondria, and triggering enzyme activity, therefore*
3. *Promoting the killing of many pathogens: bacteria, viruses, fungi and parasites.*
4. FIR energy *strengthens the immune system* by stimulating increased production of white blood cells (leukocytes) by the bone marrow and killer T-cells by the thymus gland.

5. Far infrared heat promotes the *rebuilding of injured tissue* by having a positive effect on the fibroblasts (connective tissue cells necessary for repair) and it increases the growth of cells, DNA and protein synthesis necessary during tissue repair and regeneration.
6. FIR energy *relieves nervous tension*. It reduces soreness in nerve endings and muscle spasms by heating the muscle fibers.
7. It improves the balance of blood pressure, blood sugar, and nutrients in the cells, resulting in *increased muscle strength, vitality and mental stability*.
8. Far Infrared heat *strengthens the cardiovascular system* by causing heart rate and cardiac output increases, *and diastolic blood pressure decreases*.

NASA concluded in the 1980's, that far infrared stimulation of cardiovascular function is the ideal way to maintain cardiovascular conditioning in astronauts involved in long space flights.

Far infrared rays are anti-viral, anti-bacterial and anti-fungal and can therefore be beneficial in the treatment of a variety of diseases.

Relaxation

A 45-60 minute session in a Fit Bodywrap leads to a sense of profound relaxation, as reported by innumerable clients.

It turns out that relaxation is much more important to health than most of us realize. The American Institute of Stress estimates that *75 to 90% of all visits to primary care physicians are for stress-related problems*. It would seem wise to have a system in place to reduce your stress burden, wouldn't it?

Long-term stress is the cause of countless ill-effects on the body, including increased blood pressure, weight gain and weakening of the immune system. According to New York Times best-selling author and fitness expert Jorge Cruise – as well as many other health professionals – the more stressed you are, the more cortisol your body produces. Cortisol is a “fight or flight” hormone made in the adrenal glands that raises heart rate and blood pressure and leads to the deposit of excess calories in the midsection, i.e. a fat tummy.

Scientific evidence also shows that immersive infrared thermotherapy as from the Fit Bodywrap helps maintain healthy levels of cortisol. While cortisol levels stay the same or rise slightly during a Fit Bodywrap therapy session, the far IR rays will drop them immediately afterward.

Pain Relief

Infrared waves penetrate the body to create heat that results in immediate therapeutic benefits *through increased blood flow and tissue oxygenation that provides more energy to heal*. The study by Matsushita et al. (2008) found that ***chronic pain patients experienced a significant reduction in pain levels (nearly 70%) after the first session of infrared therapy***. Pain experience also decreased significantly and remained low throughout the observation period.

Pain may be relieved via the reduction of attendant or secondary spasms. Pain is also at times related to ischemia (lack of blood supply) due to tension or spasm that can be improved by the

hyperthermia that heat-induced vasodilatation produces, thus breaking the feedback loop in which the ischemia leads to further spasm and then more pain. Blood flow increases from 5-7 quarts up to 13 quarts a minute (Imamura, 2001, p. 1084).

Heat has been shown to reduce pain sensation by direct action on both free-nerve endings in tissues and on peripheral nerves. In one dental study, repeated heat applications led finally to abolishment of the whole nerve response responsible for pain arising from dental pulp.

Heat may lead to both increased endorphin production and a shutting down of the so-called "spinal gate" of Melzack and Wall, each of which can reduce pain.

Localized infrared therapy using lamps tuned to the 2 to 25 micron wavebands are used for the treatment and relief of pain by over 40 reputable Chinese medical institutes.

Thus, infrared heat therapy such as from the Fit Bodywrap is effective for chronic pain treatment.

Musculo-skeletal Improvements

In Chapter 9 of *Therapeutic Heat and Cold*, Fourth Edition, editors Justus F. Lehmann, M.D., Williams, and Wilkin, they state that Infrared Heat Therapy like that from the Fit Bodywrap does the following:

1. *Increases the extensibility of collagen tissue.*

Tissues heated to 45°C and then stretched exhibit a non-elastic residual elongation of about 0.5 to 0.9% that persists after the stretch is removed. This does not occur in these same tissues when not heated. Repeated sessions can produce a 10 to 18 percent increase in length of tissues heated and stretched.

Stretching of tissue in the presence of heat would be especially valuable in working with ligaments, joint capsules, tendons, fasciae, and Synovium that have become scarred, thickened, or contracted. Such stretching at 45°C caused much less weakening in stretched tissues for a given elongation than a similar elongation produced at normal tissue temperatures.

Experiments cited clearly showed low-force stretching could produce significant residual elongation when heat is applied together with stretching or range-of-motion exercises. This is safer than stretching tissues at normal tissue temperatures.

2. *Decreases joint stiffness in RA and other types of stiffened joints.*

There was a 20% decrease in rheumatoid finger joint stiffness at 45°C as compared with 33°C, which correlated perfectly to both subjective and objective observation of stiffness. Speculation has it that any stiffened joint and thickened connective tissues may respond in a similar fashion.

3. *Relieves muscle spasms.*

Muscle spasms have long been observed to be reduced through the use of heat, be they secondary to underlying skeletal, joint, or neuropathological conditions. This result is possibly produced by the combined effect of heat on both primary and secondary afferent nerves from spindle cells and from its effects on Golgi tendon organs. The results produced demonstrated their peak effect within the therapeutic temperature range obtainable with radiant heat from the Fit Bodywrap.

4. Increases blood flow.

Heating one area of the body produces reflex-modulated vasodilators in distant-body areas, even in the absence of a change on core body temperature. Heat one extremity and the contralateral extremity also dilates; heat a forearm and both lower extremities dilate; heat the front of the trunk and the hand dilates.

Heating muscles produces an increased blood flow level similar to that seen during exercise. Temperature elevation also produces an increased blood flow and dilation directly in capillaries, arterioles, and venules, probably through direct action on their smooth muscles. The release of bradykinin, released as a consequence of sweat-gland activity, also produces increased blood flow and vasodilatation.

Whole-body hyperthermia, with a consequent core temperature elevation, further induces vasodilatation via a hypothalamic-induced decrease in sympathetic tone on the arteriovenous anastomoses. Axonal reflexes that change vasomotor balance also produce vasodilatation.

5. Resolution of inflammatory infiltrates, edema, and exudates.

Increased peripheral circulation provides the transport needed to help evacuate edema, which can help inflammation, decrease pain, and help speed healing.

6. Soft tissue injury repair and Pain control for chronic pain.

Infrared healing is now becoming a leading edge care for soft tissue injuries to promote both relief in chronic or intractable "permanent" cases, and accelerated healing in newer injuries.

7. Quick muscle recovery – after regular workouts and exercises.

The increased peripheral circulation from infrared heat reduces inflammation, decreases pain and speeds healing – the important steps in helping the body recover from strenuous activity.

The use of a Fit Bodywrap for whole body exposure is one of the effective ways to:

- 1) extend enhanced cardiovascular activity post “workout”,
- 2) heal strained muscles after the exercise, and
- 3) repair physical damage to the tissues and muscles.

Success has also been reported from infrared treatments by Japanese researchers (see "*The Scientific Basis and Therapeutic Benefits of Far Infrared Ray Therapy*", by Kyou) for the following Musculo-skeletal conditions:

- 1) *Arthritis, Gout, Rheumatoid, DJD* (each substantially relieved or improved).
- 2) *Adhesions* (common in competitive athletes, trauma, and repetitive stress syndromes).
- 3) *TMJ Arthritis*.
- 4) *Soft tissue Injuries* from Accl-Decel (motor vehicle related) accidents
- 5) *Low-Back Pain* (relieved).
- 6) *Bursitis* (eliminated).
- 7) *Brain Contusion* (accelerated healing).
- 8) *Disc-Protrusion Related Neuralgia*.
- 9) *Compression Fractures* (in one situation pain stopped for three days with one treatment).
- 10) *Muscle Tension* (relaxed).
- 11) *Muscle Spasms* (reduced or eliminated).
- 12) *Post-Exercise Muscle Pain* (good results - vital to competitive athletes).
- 13) *Raynaud's Syndrome* (also Dr. Gordon Ko and Dr. David Berbrayer at Sunnybrook and Women's College Health Science Centers at the University of Toronto, published in the August 2002 issue of *Alternative Medicine Review "Journal of Clinical Therapeutics"*, showed that there are significant improvements in both subjective measures of pain and discomfort associated with Raynaud's Syndrome).
- 14) *Shoulder pain* (relieved or improved).
- 15) *Spinal Cord Shock* (reversed post traumatic paralysis due to shock).
- 16) *Tight Shoulders* (more relaxed).
- 17) *Traumatic Arthritis*.

Carpal Tunnel Syndrome

One of the fastest growing complaints in this country today, carpal tunnel syndrome (CTS) responds to (FIR) as well. CTS is caused by motion and trauma to the median nerve passing through the wrist. Assembly line workers are particularly prone to the problem. The standard medical treatment for CTS is still surgery, which has a dismal success rate of less than 10%. Dr. Wayne Good, the plant physician at General Motors Flint Assembly plant treated close to 600 patients with FIR, as delivered by Fit Bodywrap, and achieved positive results in over 70% of patients. He was in the process of submitting his results for publication as further studies continued.

Anti-Aging & Skin Purification

Hypertension and osteoporosis, headaches and digestive problems, are attributed by some scientists to be the result of excess acidity in our system. The American Medical Association's Journal found that in patients with bone loss, alkalizing their system caused a decrease in bone loss. Their conclusion was that our typical American diet is acid producing.

The acids deposited in our blood are often stored by the body in forms of cholesterol, fatty acid, uric acid, and other villains that cause havoc in our system. Philanthropist and researcher Sang Whang, the author of "Reverse Aging" (1991), claims that these excess acids can be eliminated with the use

of far infrared products like Fit Bodywrap, along with consuming certain alkaline minerals and foods.

Relying on the Fit Body wrap to increase circulation while using the right alkalizing supplements would enable the blood to transport for excretion the melted out acidic toxins that had been deposited over years in one's arteries.

Studies suggest that far infrared light stimulates the production of cell tissue and rapidly promotes the regeneration of skin and blood tissue (from "Reversing the Aging Process - an Enlightened Doctor's Discovery", ©1999 by Dr. Fouad I. Ghaly, M.D.).

Infrared heat therapy using the Fit Bodywrap is useful in the treatment of a variety of aging factors. The term photoaging refers to changes in the skin that accompany the changes associated with the chronological aging such as wrinkling of skin, uneven skin pigmentation, loss of skin elasticity, and disturbance of skin barrier functions (Yaar, 2006). Changes to skin and the extracellular matrix of the dermis are significant contributors to photoaging, also accompanied by collagen degradation and accumulation of the abnormal elastic fibers. Infrared thermotherapy may improve the condition of the skin through increased metabolism, oxygenation of tissue, and increased blood flow that may *delay the effects of photoaging*.

Anti-Aging via Improved Blood Circulation

Infrared immersive therapies such as Fit Bodywrap work by exerting stress in the form of heat on the body and the body responds with attempts to cool off by releasing sweat. While some use saunas for immersive infrared a lot of people cannot stand saunas due to the high temperatures that prevents normal breathing while the Fit Bodywrap avoids this issue allowing users to breath air at room temperature.

Such immersive IR exposures increase heart rate, cardiac output and metabolic rate, burning more calories, leading to more weight loss.

Blood flow increases from 5-7 quarts up to 13 quarts a minute (Imamura, 2001, p. 1084).

Blood circulation is an important factor in human wellness because the blood supplies oxygen and nutrients to the body's tissues and cells. Red blood cells, called erythrocytes, carry oxygen to the organs, tissues, and cells in the body and perform an important function of controlling the release of a compound known as adenosine triphosphate (ATP).

ATP is the energy molecule of the living organism that transports chemical energy within cells for metabolism. Erythrocytes release ATP when they arrive in a region of tissue where oxygen need is increased, such as an exercising muscle. Thus, increased blood flow helps organs and cells to receive more oxygen from which to make more ATP, improving your metabolism. The benefits of increased blood circulation include passive exercise for the heart muscle and conditioning for the blood vessels.

Passively experiencing immersion in infrared radiation gives you similar results as from workout regimes that increase blood flow to vital organs and muscles. Thus, infrared light has a potential of minimizing problems arising from poor blood flow to organs such as:

- 1) tiredness,
- 2) formation of blood clots

- 3) heart disease (Infrared radiation makes the heart work at full force which puts it in a very productive state in which heart muscles are more relaxed and work in an efficient manner that helps even out blood pressure),
- 4) deep vein thrombosis
- 5) and Raynaud's disease

Increasing blood circulation leads to many beneficial effects upon the human body such as promoting cell growth and organ functions, rejuvenation of skin, and maintenance of healthy blood pressure. The oxygen supply from blood flow is very important for the brain to maintain its cognitive functions.

Diabetes.

One of the main benefits of increased blood pressure during exposure (while lowering it between exposures) from infrared radiation can be realized by persons suffering from diabetes. The American Diabetes Association (2013) states that in both Type 1 and Type 2 diabetes, there are various disturbances in the circulatory system, and much of this is due to the fact that the blood vessels are exposed to unusually high levels of circulating sugar for prolonged periods which damages the blood vessels, especially in the inner layer (endothelial cells). Increased blood flow from infrared radiation *reduces the ailments of diabetes*, helping the human body to distribute sugars and oxygen more evenly to various muscles, tissues, and cells.

Detoxification

Immersive infrared use is reported to generate sweats containing 15-20 percent toxins compared to only 3-5 percent in traditional saunas or through regular exercise.

Immersive IR detoxification is based on the action of heat waves to penetrate the skin and the removal of toxic substances with sweat. Ridding the body of these toxins through such a detox may help relieve symptoms, prevent future illness and increase overall health and vitality.

The United States Center for Disease Control (CDC) estimates that the root causes of more than 80% of all illnesses are found in personal environments or lifestyles. Poor daily interaction can affect people in a harmful way. People who live in urban areas are constantly exposed to the toxic substances such as automobile exhaust gases, dust, toxic particles in the air, and other sources. Much of the captured toxic substances are trapped in human skin that can only be cleaned through the use of immersive IR sweating sessions like those in using the Fit Bodywrap or marathon levels of training.

Body sweat helps remove toxic substances and heavy metals.

Detoxification is important because it strengthens the body's immune system and helps the body's biochemical processes function efficiently so that we are not taken toward inflammation as toxic levels build up in us.

Detoxification has also been shown to be helpful with:

- 1) *colitis*,
- 2) *chronic fatigue*.

- 3) fibromyalgia.
- 4) auto-immune disease.
- 5) immune deficiency states.
- 6) autism, ADD and ADHD.

“One of the reasons FIR has beneficial results in a variety of illnesses is the ability of FIR waves to remove toxins, which are often at the core of many health problems. Toxins that cannot be removed immediately after they enter the body are encapsulated by clusters of water. Blood circulation becomes blocked and the cellular energy impaired where these toxins accumulate.

However, when a 10-micron FIR wave is applied to water molecules containing toxins, the water begins to vibrate. This vibration reduces the ion bonds of the atoms that are holding together the molecules of water. As the breakdown of the water molecules occurs, encapsulated gases and other toxic materials are released. One study done by American researchers showed that the sweat released by users of a FIR sauna was different than the sweat of people using a conventional sauna or doing normal exercise. The non-water portion of sweat released by immersive FIR –therapy was cholesterol, fat soluble toxins, toxic heavy metals, sulfuric acid, sodium, ammonia and uric acid.”

- Dr. Kyuo, Japan.

Toxic overload has been implicated in many health conditions, from fibrocystic breast disease (FBD) in women to attention deficit hyperactivity disorder (ADHD) in children. Symptoms of toxic overload include fatigue, headaches, joint or muscle pain, frequent colds and flu, signs of allergy and hormonal imbalance, chemical sensitivity, sinus congestion, psoriasis and other skin conditions, loss of dexterity, insomnia and more. Psychological symptoms include poor concentration, memory loss, mood changes, mental confusion and changes in behavior.

Far Infrared energy generated by the Fit Bodywrap is thought to be 7 times more effective at detoxifying heavy metals such as mercury, aluminum, and even cholesterol, nicotine, alcohol, ammonia, sulfuric acid and other environmental toxins when compared to immersion in hot air or steam saunas.

Help with Cancer

According to the National Cancer Institute of the National Institutes of Health (2013), “Hyperthermia is a type of cancer treatment in which body tissue is exposed to high temperatures (up to 113°F) to damage and kill cancer cells”. Hyperthermia means a body temperature that is higher than normal. High body temperatures are often used by the body itself to speed its recovery from illnesses.

But hyperthermia can also refer to heat treatment—the carefully controlled use of heat to induce these same self-healing mechanisms for medical purposes. When cells in the body are exposed to higher-than-normal temperatures, changes take place inside the cells. Some of these changes can make the cells more likely to be affected by radiation therapy or chemotherapy. Very high temperatures can kill cancer cells outright (American Cancer Society).

Several research groups have determined that high temperatures can damage and kill cancer cells with minimal injury to healthy cells (Dees et al., 2002). The Far infrared radiation (IR-C) from the Fit Bodywrap is able to penetrate well below our skin and reach the internal organs, where tumors and cancer cells may be located.

One of the guiding principles of hyperthermia for malignancies is that cancer cells are much more sensitive to and intolerant of the effects of excessive heat than normal cells. Tumors have an impaired ability to adapt their blood circulation to the effects of high temperatures and thus hyperthermia can cause a reduction of blood flow to a tumor. The vascular disorganization of a solid tumor results in an unfavorable microenvironment inside tumors for extra IR energy. Consequently, the tumor cells, already stressed by low oxygen, higher than normal acid concentrations, and insufficient nutrients, are significantly less able to tolerate the added stress of heat than a healthy cell in normal tissue.

Cancer usually leads to uneven distribution of heat within the human body. As the body's core temperature decreases all cellular energy also decreases. The cooperative and collective intelligence of the human organism is short-circuited as the body temperature cools. As a result, all cellular functions decrease. The use of infrared heat from a Fit Bodywrap is the easy way to sustain adequate body temperatures for this approach.

All chemical reactions in the body are facilitated by enzymes. Every chemical reaction usually requires some type of input energy to get things going, and that initial energy can sometimes be quite intense. An enzyme is an intermediate in chemical reactions that helps lower the energy needed to get a reaction started, and that is unchanged in the reaction. Enzymes only work correctly when conditions are within a narrow range. The enzymes depend on: 1) pH, which in part depends on CO₂ levels and 2) cell voltage and 3) cell temperature.

Body temperatures below 98.2° F, (36.8° C) may cause various maladies due to a slowing of enzymatic processes.

As the Fit Bodywrap heats up the body deeply and directly it is very effective. Since there is a low blood flow within the tumor mass, its temperature can be easily increased. Since the normal tissues surrounding the tumor mass have a normal heat removal system, their temperature will not be increased as much as the cancer cells. Therefore, there will be a temperature gradient between the cancer cells and the normal cells.

When the tumor mass is at 42° C, it will become inactive. However, since a normal cell's temperature is limited up to 40° C due to the cooling effects of blood flow, they will not be as affected as the tumor cells. Since tumor cells do not have a sufficient amount of blood vessels, their cooling is not under regulation of the brain. Being without enough blood flow, tumors produce lactates and are in an acidic state. As cells become more acidic, they become more sensitive to being destroyed by heat. Thus, when the tumor temperature is increased to more than 107.6° F, cancer cells are more likely to die naturally.

Using the Fit Bodywrap as an adjunct to cancer treatment has no side effects and raising tumor temps to 107.6° F is very effective at helping cancer patients survive their cancers. Only good feelings of warmth and returning health and strength come from warming the body with radiant heat during thermotherapy.

Dr. Frank T. Kobayashi has been performing thermotherapy to treat cancer for years. He spoke at the Anti-Aging Medicine World Congress, a gathering of more than 3,000 physicians from around the world, in Paris in March 2006. Kobayashi's lectures included "The Complete Method of an

International Expert in Curing/Increasing the Survival of Cancer with Alternative Therapies", "New Successful Methods of Prevention and Treatment of Cancer: Efficient Improvement of Survival of Cancer Patients by Alternative Treatments; Concrete Examples of Long-Term Surviving Cancer Patients", and "How to Survive Cancer Much Longer: The Keys to Medical Success".

When he implemented thermotherapy in large hospitals, *70% of 52 end-stage cancer patients became better after the treatment.* This treatment combines two hours of thermotherapy with chemotherapy treatments. By combining the two treatments, they were able to reduce the drug dosage by 5-10 percent. The treatment was aiming to lead cancer cells into spontaneously self-destructing by increasing the body temperature up to 39-40° C. When the body temperature is at 102-104° F (i.e. 39-40° C.) the body's immune response is improved 2-20 times as well.

The study by Ishibashi et al. (2007) showed that FIR should be a very effective medical treatment for some cancer cells which have a low level of HSP70. Still more, if the level of HSP70 in any cancer of a patient was measured, the effect of medical treatment by FIR can be foreseen for the cancer. These results indicate that the effect of attaining a body temperature range that lowers cancer cell self-protection with Fit Bodywrap should also suppress the growth of susceptible cancer cells.

Cancerous cells cannot exist, we are told, if blood circulation is smooth and continuous enough to produce high levels of O2 saturation and perfusion through all of the smallest capillaries, it is said. A cancerous cell has to stop moving to proliferate. The cancerous cell's positioning, or settling down, is directly related to the capillaries, which are at the end of the blood vessels. The cancer cell tries to position itself by going through the capillary. If it goes through, there could be no settling down or positioning of the cancer cell - which is what happens if there is good blood circulation. If the cancer cell fails to pass through the capillary because of some functional disorder in the circulation, the cell could easily position itself. Good blood circulation of the capillaries - without functional disorder - leaves no way for the cancerous cell to settle down and position itself. The cell will then be killed by one's immunocytes (your immunity cells).

High Blood Pressure

In the U.S. alone, one in three adults suffers from heart disease, stroke or some other form of cardiovascular disease in their lifetime. *High blood pressure increases the risk of getting heart disease, kidney disease or serious stroke.*

In a 2005 clinical study by the University of Missouri Kansas City immersive infrared sessions like those in a Fit Bodywrap *were shown to lower blood pressure* through a program of 30 minute infrared sessions 3 times per week (Edwards, et al., 2005). The study concluded that immersive infrared therapy dilated blood vessels and reduced the volume of their inner lining, thus lowering resistance to blood circulation that in turn leads to healthier blood pressure.

Pre Sun-tanning Protection

Frank et al. (2006) reported that FIR pre-soaking human tissue cells boosted 3 major pathways that prepare cells to better resist subsequent UV-induced stress. Several further studies have concluded that infrared radiation provides resistance to UV-induced cell damage from over-exposure. It works via reduction of DNA damage and an increased production of proteins that protect stressed

cells enough to prevent their death from UV over-exposures. (Jantschitsch et al., 2008, p. 1271). Also, according to the Clayton's Electrotherapy, 9th Edition, far infrared radiation is the only antidote to sunburn from too much ultraviolet radiation.

Dialysis and IR to the rescue

Vascular access malfunction, usually presenting with an inadequate access flow (Qa), is the leading cause of morbidity and hospitalization in hemodialysis (HD) patients. FIR immersive therapy such as from Fit Bodywrap can improve Qa and survival of the AVF in HD patients through both its thermal and its non-thermal effects (Lin et al., 2007).

Wound Healing

Skin provides an important role in the protection of human body from the external environment. It protects the body from infections, diseases, toxic chemicals, and viruses. When skin is damaged, it creates a way for harmful compounds and infections to enter the body. The temporary epithelial layer that is formed at the wound site is not protective enough to fully prevent from external environmental intrusions. According to Whelan et al. (2001), *human cell growth has been observed to increase by from 155%-171%* and *wound size decreased by 36%* after the application of infrared light such as from the Fit Bodywrap.

Contraindications

The segment of the infrared spectrum emitted by the Fit Bodywrap has been shown to offer an astounding range of possible therapeutic benefits in research conducted around the world. The data presented herein is offered for reference purposes only and to stimulate further observation. **No implication that the Fit Bodywrap is a cure for or treatment of any disease is implied nor should it be inferred.**

- a) If you have a disease, be certain to consult with a primary-care physician concerning it.
- b) If you are using any prescription drugs, check with you physician or pharmacist for any possible change in the drug's effect due to any interaction with infrared energy.
- c) It is considered inadvisable to raise the core temperature in someone with adrenal suppression, systemic lupus erythematosus or multiple sclerosis, by some authorities.
- d) If you have a recent (acute) joint injury the old school admonition is that it should not be heated for the first 48 hours after the insult or until the hot and swollen symptoms subside. While this may apply the more modern concept is move, exercise, attenuate the pain and treat the injured tissues, the first two of which far infrared does do. If you have a joint or joints that are chronically hot and swollen, these joints may respond poorly to vigorous heating of any kind.
- e) Vigorous heating is strictly contraindicated in cases of enclosed infections be they dental, in joints or in any other tissues.
- f) If you are pregnant or suspect you may be, discontinue your Fit Bodywrap use. Finnish women use their saunas, which don't throw heat as deeply into the body, for only 6-12 minutes and reportedly leave at that time, due to perceived discomfort. Their usage at this low level of intensity is not linked to birth defects. IR Thermal Systems use may be 2-3 times more intense, and comparatively shorter 2-6 minute sessions hardly seem worth any minimal risk they may present.
- g) Metal pins, rods, artificial joints or any other surgical implants generally reflect infrared rays and thus are not heated by these wave lengths, nevertheless you should consult your surgeon prior to using an IR Thermal System. Certainly, IR Thermal System use must be discontinued if you experience pain near any such implants.
- h) Silicone does absorb infrared energy. Implanted silicone or silicone prostheses for nose or ear replacement may be warmed by the infrared rays. Since silicone melts at over 200°C it should not be adversely effected by IR Thermal System use. The Fit Bodywrap has an off switch for the breast region to avoid a problem from this issue. It is still advised that you check with your surgeon and possibly a representative from the implant product manufacturer to be certain about safety.
- i) Heating of the low back area of women during the menstrual period may temporarily increase their menstrual flow. Once a woman is aware that this may occur, she can choose to allow herself to possibly experience this short-term effect without worry or to simply avoid IR Thermal System use at that time of her cycle.
- j) Haemophiliacs and anyone predisposed to haemorrhage should avoid IR usage or any type of heating that would induce vasodilation which can potentiate the tendency to bleed.
- k) Obviously, should any condition worsen with use of the Fit Bodywrap, the use of the system should be discontinued.
- l) People do not experience increased pain using the Fit Bodywrap unless such use is contraindicated. If you do, the use of radiant heat is clearly inappropriate for you at that time.

Do not attempt to self-treat any disease with a Fit Bodywrap without direct supervision of a physician.

References and supporting clinical research:

- Applegate L.A., Scaletta C., Panizzon R., Frenk E., Hohlfeld P., Schwarzkopf S. (2000) Induction of the putative protective protein ferritin by infrared radiation: implications in skin repair. *Journal of Molecular Medicine* (5):247-51
- Beever R. (2010). "Do Far-Infrared Saunas have Cardiovascular Benefits in People with Type 2 Diabetes?" *Canadian Journal of Diabetes* 34(2): 113 - 118.
- Edwards B., Kort H., & Foxworth, J. (2005). "A Study of the Health Benefits of Far Infrared Sauna Therapy - Conducted by the University of Missouri, Kansas City".
- Frank S., Menezes S., Lebreton-De Coster C., Oster M., Dubretet L., & Coulomb B. (2006). Infrared radiation induces the p53 signaling pathway: role in infrared prevention of ultraviolet B toxicity. *Experimental Dermatology* 15:130-7.
- Horwitz L.R., Burke T.J., & Carnegie D. (1999) Augmentation of wound healing using monochromatic infrared energy. Exploration of a new technology for wound management. *Advances Wound Care* (12):35-40
- Hu K.H., & Li W.T. (2007). Clinical effects of far-infrared therapy in patients with allergic rhinitis. *Conf Proc IEEE Eng Med Biol Soc.* 2007;2007:1479-82. PubMed.
- Imamura, M. et al. (2001). "Repeated Thermal Therapy Improves Impaired Vascular Endothelial Function in Patients With Coronary Risk Factors". *Journal of American College of Cardiology* 38(4):1083-1088.
- Ishibashi J, Yamashita K, Ishikawa T, Hosokawa H, Sumida K, Nagayama M, Kitamura S. (2007). The Effects Inhibiting the Proliferation of Cancer Cells by Far-infrared Radiation (FIR) are controlled by the basal expression level of heat shock protein (HSP) 70A. *Med Oncol.* 25(2):229-37.
- Jantschitsch, C., Majewski, S., Maeda1, A., Schwarz, T., & Schwarz, A. (2009). Infrared Radiation Confers Resistance to UV-Induced Apoptosis Via Reduction of DNA Damage and Upregulation of Antiapoptotic Proteins. *Journal of Investigative Dermatology.* 129: 1271-1279. doi:10.1038/jid.2008.362
- Jung, T. & Grune, T. (2012). Experimental basis for discriminating between thermal and athermal effects of water-filtered infrared A irradiation. *Annals of the New York Academy of Sciences. Issue: Environmental Stressors in Biology and Medicine.* 1259:33-38.
- Kandolf-Sekulovic L., Kataranovski M., Pavlovic M.D. (2003). Immunomodulatory Effects of Low-Intensity Near-Infrared Laser Irradiation on Contact Hypersensitivity Reaction. *Photodermatology, Photoimmunology & Photomedicine* 19:203-212,
- Kochevar I.E., Pathak M.A., Parrish J.A. (1999) Photophysics, photochemistry, and photobiology. In: *Fitzpatrick's Dermatology in General Medicine* Freedberg I.M., Eisen A.Z., Wolff K. et al. (eds), 5th ed., New York: McGraw-Hill, 220-9.
- Lin C.C., Chang C.F., Lai M.Y., Chen T.W., Lee P.C., Yang W.C. (2007). Far-infrared therapy: A Novel Treatment to Improve Access Blood Flow and Unassisted Patency of Arteriovenous Fistula in Hemodialysis patients. *Journal of the American Society of Nephrology* 18(3):985-92.
- Matsushita L., Masuda A., Tei C. (2008, Aug 15). *The First Department of Internal Medicine, Kagoshima University Hospital, Kagoshima, Japan.*

- National Cancer Institute. (2013). Hyperthermia in Cancer Treatment.
<http://www.cancer.gov/cancertopics/factsheet/Therapy/hyperthermia>
- Nagasawa H, Udagawa Y, Kiyokawa S. (1999). Evidence that irradiation of far-infrared rays inhibits mammary tumour growth in SHN mice. *Anticancer Research*. 1999 May-Jun; 19(3A):1797-800
- Nishigori, C. (2006). Cellular aspects of photocarcinogenesis. *Photochemistry & Photobiology Sciences* 5:208-214.
- Schramm J.M., Warner D., Hardesty R.A., Oberg K.C. (2003) A unique combination of infrared and microwave radiation accelerates wound healing. *Plast Reconstr Surg* 111:258-66
- Yokoyama K, Oku T. (1999) Rheumatoid arthritis-affected temporomandibular joint pain analgesia by linear polarized near infrared irradiation. *Canadian Journal of Anaesthetics* (46):683-7
- Udagawa Y., Nagasawa H., Kiyokawa S. (1999). Inhibition by Whole-Body Hyperthermia (WBH) with Far-infrared rays of the Growth of Spontaneous Mammary Tumours in mice. *Anticancer Research* Sep-Oct, 19(5B):4125-30.
- Udagawa Y., Nagasawa H. (2000). Effects of Far-infrared ray on Reproduction, Growth, Behaviour and some Physiological Parameters in Mice. *In Vivo*. 2000 Mar-Apr; 14(2):321-6.
- Whelan, H.T., Buchmann, E.V., Whelan N.T., Turner S.G., Cevenini, V., Stinson H., Ignatius R., Martin T., Cwiklinski J., Meyer G.A., et al. (2001). NASA Light Emitting Diode Medical Applications From Deep Space to Deep Sea. CP552, Space Technology and Applications International Forum-2001, edited by M. S. El-Genk. *American Institute of Physics* 1-56396-980-7/01.
- Wong-Riley M.T-T., Liang H.L., Eells, J.T., Chance B., Henry M.M., Buchman, E., Kane M., and Whelan, H.T. (2004). Photobiomodulation Directly Benefits Primary Neurons Functionally Inactivated by Toxins: Role of Cytochrome C Oxidase. *JBC Papers in Press*. Published on November 22, 2004 as Manuscript M409650200. Copyright 2004 by The American Society for Biochemistry and Molecular Biology, Inc.