

Infrared Technology

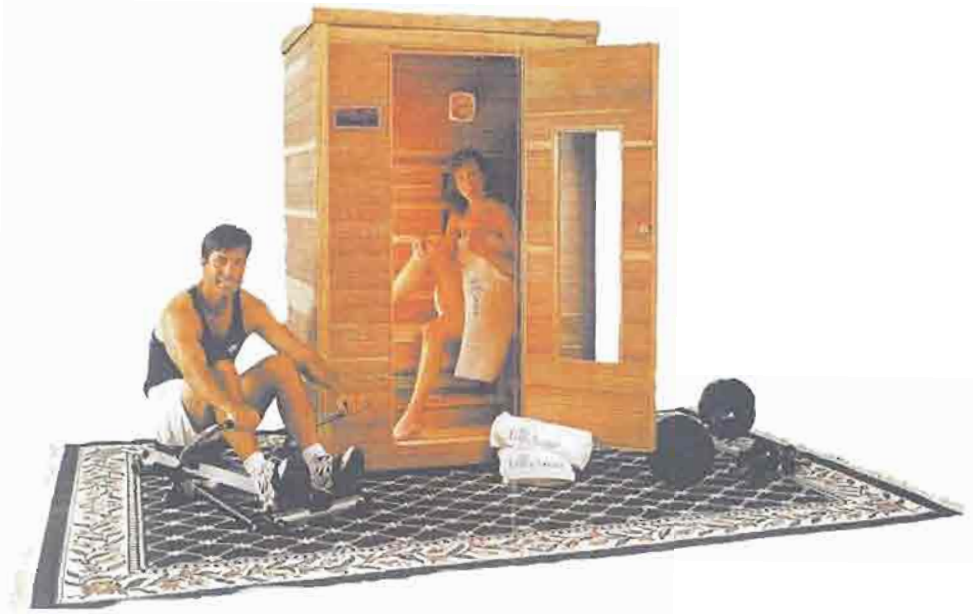
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*TheraSauna™
and
Infrared
technology—
the healthy
combination.*

Scientists and physicians from every corner of the planet are studying specific light wavelengths of light including Infrared. They are expanding their knowledge and ours on the therapeutic effect of light wavelengths on our bodies.

For Centuries, scientists have known that plants are dependent upon sunlight for photosynthesis. Only recently has science recognized the similarities between humans and plants and their dependence upon light.

We know that energy from the sun's rays, photons, controls vital processes in both plants and people. In humans, photons are the catalyst for the production of sugars, fats, and proteins. Photons stimulate the endocrine system, metabolic processes and enzyme reactions as well as activities in the brain.

When this connection is disturbed, our bodies malfunction. For example, when normally activated enzymes in the body's cells fail to receive the proper wavelengths of light, they remain dormant. As a result, they cannot start up normal, cellular metabolic reactions. This translates into lower cellular energy, glandular insufficiencies and reduced ability to burn fats and toxins.

According to Dr. Jacob Liberman, O.D., Ph.D., author of Light Medicine of the Future describes the body as a living photocell, stimulated and regulated by light. "Our lives, our health and well-being are truly dependent on the sun. The human body is nourished directly by the stimulation of sunlight or nourished indirectly by eating foods, drinking fluids, or breathing air that has been vitalized by the sun's light energy."

When light enters the eye, millions of light sensitive cells convert the light into electrical impulses. These impulses travel along the optic nerve to the brain where they trigger the

can choose to allow herself to experience this short-term effect without worry. Or she may simply avoid using an infrared heat source at that time in her cycle.

Hemorrhage: Hemophiliacs and anyone predisposed to hemorrhage should avoid infrared usage or any type of heating that would induce vasodilatation that can lead to the tendency to bleed.

Worsened Condition: Should any condition worsen with the use of an infrared heat system, the use of the system should be discontinued.

Pain: Pain should not be experienced when using an infrared heat system. If one does, the use of radiant heat is clearly inappropriate for the person at that time.

What is Infrared Heat?

Radiant heat is a form of energy that heats objects directly through conversion without having to heat the air between. Radiant heat is also called infrared energy or IR. The electromagnetic spectrum is divided into three segments by wavelength, measured in microns (micron=1/1,000,000 of a meter): 0.076 to 1.5 microns = near to close; 1.5 to 5.6 = middle or intermediate; 5.6 to 1000=far or long wave infrared. The far infrared segment occurs just below red light as the next lowest energy band. This band of light is not visible to human eyes but can be seen by special cameras that translate infrared into visible colors. We can, however, feel this type of light, which we perceive as heat. The sun produces most of its energy in the infrared segment of the spectrum. Our atmosphere has a "window" in it that allows infrared rays—in the 7 to 14 micron ranges—to safely reach the earth's surface. When warmed, the earth radiates infrared rays in the 7 to 14 micron bands with its peak output at 10 microns.

The infrared heat produced by infrared saunas, such as the TheraSauna™ is similar to the heat from the sun.

Our tissues normally produce infrared energy and burn it as fuel to keep us warm and use it for tissue repair. Tissue production of infrared energy is associated with a variety of healing responses. Occasionally, the infrared energy in our tissues needs a boost to insure best possible healing for tissue repair. Dr. Tsu-Tsair Oliver Chi, when summing up how infrared devices are attuned to the human body, reported that body tissues that need an infrared boost selectively absorb rays. After boosting a tissue's infrared energy, the remaining rays pass onward harmlessly. This phenomenon is called "resonant absorption."

Our bodies radiate infrared energy through the skin at 3 to 50 microns, with most output at 9.4 microns. Our palms emit infrared energy also, between 8 and 14 microns. Palm healing, an ancient tradition in China, has used the healing properties of infrared rays for 3,000 years. Yogis in India also employ palm healing and recommend it especially for relieving eye strain.

History of the Sauna and Development of Infrared Technology

The Finns popularized sauna use. Their ancient religious ceremonies used it for mental, spiritual, and physical cleansing. Use of the sauna in their religion stayed with them when they migrated from Tibet to their present location between 5,000 and 3,000 BC. Native Americans used sweat lodges for cleansing and purifying, recognizing the health of sweat as well.

Dr. Tadashi Ishikawa, a member of the Research and Development Department of Fuji Medical, received a patent in 1965 for a zirconia ceramic infrared heater used in the first healing infrared thermal systems. Medical practitioners in Japan were the only ones using infrared thermal systems for 14 years. In 1979, they were finally released for public use. The technique has been further refined into infrared thermal systems that have been sold in the United States since 1981. One use of infrared heat in the United States has been in the form of panels used in hospital nurseries to warm newborns.

Energy Band of Infrared Saunas

Heaters used in infrared saunas emit about one-third of their output in the middle infrared band – from 2 to 5.6 microns – for deep penetration and the other two-thirds in the long band – from 5.6 to 25 microns. The output is evenly spread around the 9.4-micron pivot point of peak human output. This distribution maximizes the higher penetration of the middle band waves and combines them with the long waves that produce resonant absorption for healthy tissue output. Chinese researchers consider a band between 2 to 25 microns the most therapeutic.

Infrared Heaters and Electromagnetic Fields

Recently there have been reports detailing the hazards of exposure to certain kinds of electromagnetic fields, such as those from high-tension power lines, cell phones, or from computer display terminals.

How the TheraSauna™ is Unique

An infrared heater, such as the one used in the TheraSauna™, employs infrared energy that penetrates body's tissues to a depth of over 1½ inches. Its energy output is tuned to correspond closely to the body's own radiant energy so that body tissues absorb close to 93% of the infrared waves that reach the skin.

A conventional sauna, in comparison, must rely on an indirect means of heat to produce its heating effect on the body. An infrared heater heats only 20 percent of the air, leaving over 80% of the heat available to directly heat the body. Thus, an infrared heated sauna can warm its users to a greater depth and more efficiently than a conventional sauna.

The TheraSauna™ heater's output creates penetrating heat and mildly warm air that only heats the skin superficially. This crucial difference between it and traditional saunas explains the many unprecedented benefits that come from its use that are not attainable in conventional saunas.

Another difference lies in the process of sweating. Infrared energy created in the TheraSauna™ may induce up to two to three times the volume of sweat produced in a traditional sauna while operating at significantly cooler temperatures (100-130°F compared to 180-235°F). The lower heat is safer for those concerned with cardiovascular risk factors that may be affected by high temperatures encountered in traditional saunas.

One issue for traditional sauna users has been breathing exceptionally hot air. It is distinctly more pleasant to breathe air that is between 50-125°F. In an infrared sauna you breathe cooler air maintaining a feeling of warmth. As a result, infrared sauna users report a feeling of well being as an after effect.

Compared to traditional saunas, which require a closed atmosphere to maintain the levels of heat required for therapeutic results, the TheraSauna™ can be used with the door or window fully open if the only desired effect is infrared penetration. Those seeking only infrared penetration might be people who use the sauna fully clothed to warm up prior to stretching, working out, running, or exposure to cold weather.

One of the practical aspects of the TheraSauna™ is that it requires only 5 to 10 minutes to warm from room temperature compared to 30 to 90 minutes for traditional saunas on a regular basis. It also makes them more practical for use in clinics and resorts.

The TheraSauna™ is inexpensive to operate. A 20-minute session, including a 10-minute warm up period, costs about 5 cents for electricity. A comparable session with the full warm-up of a conventional sauna costs about 75 cents to a dollar. In other words, daily usage of the infrared sauna will raise an electric bill by only \$1.50 a month compared to \$22 to \$30 a month using a conventional sauna, if each is used for 20 minutes after warm up. (Figures are approximate only.)

The TheraSauna™ takes only minutes to set up. Traditional saunas require building or modifying a room, or creating a separate building. Traditional Native American sweat lodges require labor-intensive installation.

World-Wide Reports on Infrared Sauna Use

Over the last 25 years, Japanese and Chinese researchers and clinicians have completed extensive research on infrared treatments and report many provocative findings. In Japan, there is an “infrared society” composed of medical doctors and physical therapists dedicated to further infrared research. Their findings support the health benefits of infrared therapy as a method of healing.

There have been over 700,000 infrared thermal systems sold in the Orient for whole-body treatments. An additional 30 million people have received localized infrared treatment in the Orient, Europe, and Australia with lamps, which emit the same 2 to 25 micron wave bands as employed in a whole-body system. In Germany, physicians in an independently developed form have used whole-body infrared therapy for over 80 years.

The Use of Infrared Heat to Produce Cardiovascular Conditioning

The August 7, 1981 issue of the Journal of the American Medical Association (JAMA) reported what is common knowledge today: Many people who run do so to place a demand on their cardiovascular system as well as to build muscle. What isn't well known is that is also reported the "regular use of a sauna may impart a similar stress on the cardiovascular system, and its regular use may be as effective as a means of cardiovascular conditioning and burning of calories as regular exercise."

It has been found that the infrared sauna makes it possible for people in wheelchairs, those who are otherwise unable to exert themselves, and those who won't follow an exercising/conditioning program to achieve a cardiovascular training effect. It also allows for more variety in any ongoing training program.

Blood flow during whole-body hyperthermia is reported to rise from a normal five to seven quarts a minute to as many as 13 quarts a minute.

Due to the deep penetration of infrared rays (over one and a half inches into body tissue), there is a deep heating effect in the muscle tissue and internal organs. The body responds to this heat with a hypothalamic-induced increase in both heart volume and rate. Beneficial heart stress leads to sought-after cardiovascular training and conditioning effect. Medical research confirms the use of a sauna provides cardiovascular conditioning as the body works to cool itself and involves substantial increases in heart rate, cardiac output, and metabolic rate. As a confirmation of the validity of this form of cardiovascular conditioning, extensive research by NASA in the early 1980's led to the conclusion that infrared stimulation of cardiovascular function would be the ideal way to maintain cardiovascular conditioning in American astronauts during long space flights.

Infrared Heat, Caloric Consumption, and Weight Control In its Wellness Letter, October 1990, the University of California Berkeley reported that "the 1980's was the decade of high-impact aerobics classes and high-mileage training. Yet there was something elitist about the way exercise was prescribed: only strenuous workouts would do, you had to raise your heart rate to between X and Y, and the only way to go was to 'go for the burn.' Such strictures insured that most 'real' exercisers were relatively young and in good shape to begin with. Many Americans got caught up in the fitness boom, but probably just as many fell by the wayside. As we've reported, recent research shows that you don't have to run marathons to become fit – that burning just 1,000 calories a week... is enough. Anything goes, as long as it burns these calories."

Guyton's Textbook of Medical Physiology reports that producing one gram of sweat requires 0.586 kcal. The JAMA citation above goes on to state that "A moderately conditioned person can easily sweat off 500 grams in a sauna, consuming nearly 300 kcal – the equivalent of running two to three miles. A heat-conditioned person can easily sweat off 600 to 800 kcal with no adverse effect. While the weight of water loss can be regained by rehydration, the calories consumed will not be." Since a sauna helps generate two to three times the sweat produced in a conventional hot-air sauna, the implications for increased caloric consumption are quite impressive.

Assuming one takes a sauna for 30 minutes, some interesting comparisons can be drawn. Two of the highest calorie output exercises are rowing and running marathons. Peak output on a rowing machine or during a marathon burns about 600 calories in 30 minutes. An infrared sauna may better this from “just slightly” up to 250% by burning 900 to 2400 calories in the same period of time. It might in a single session simulate the consumption of energy equal to that expended in a six-to-nine-mile run.

The infrared sauna can play a pivotal role in both weight control and cardiovascular conditioning. It is valuable for those who don't exercise and those who can't exercise and want an effective weight control and fitness maintenance program, and the benefits regular exercise contribute to such a program.

Musculoskeletal Improvements with Infrared Heat

Success has been reported from infrared treatments by Japanese researchers for the following musculoskeletal conditions:

- ? TMJ Arthritis
- ?? Traumatic Arthritis
- ?? Accl-Decel Injury Sequelae
- ?? Disc-Protrusion Related Neuralgia
- ?? Brain Contusion (accelerated healing)
- ?? Tight Shoulders (more relaxed)
- ?? Compression Fractures (in one situation pain stopped for three days with one treatment)
- ?? Spinal Chord Shock (reversed post traumatic shock)
- ?? Muscle Tension (relaxed)
- ?? Post-Exercise Muscle Pain (good results – vital to competitive athletes)
- ?? Arthritis Gouty, Rheumatoid, DJD (each substantially relieved or improved)
- ?? Shoulder pain (relieved or improved)
- ?? Bursitis (eliminated)
- ?? Muscle Spasms (reduced or eliminated)
- ?? Low-Back Pain (relieved)
- ?? Adhesions (lengthened or more easily broken – common in competitive athletes, trauma, and repetitive stress syndromes)

The McGraw-Hill Encyclopedia of Science and Technology reports “medical practitioners make use of infrared radiant heat to treat sprains, strains, bursitis, peripheral vascular diseases, arthritis, and muscle pain...”

Dr. Masao Nakamura of the O & P Medical Clinic in Japan has reported success with the use of infrared heat treatment for:

- ?? Whiplash

- ?? Arthritis
- ?? Shoulder Stiffness
- ?? Insomnia
- ?? Acne
- ?? Gastroenteric Problems
- ?? Ear Diseases

Effects of Infrared Heat on Rheumatoid Arthritis

A case study reported in Sweden worked with a 70-year-old man who had rheumatoid arthritis secondary to acute rheumatic fever. He had reached his toxic limit of gold injections and his Erythrocyte Sedimentation Rate (ESR) was still 125. After using an infrared heat system for less than five months, his ESR was down to 11.

The rheumatologist worked with a 14-year-old Swedish girl who had difficulty walking down stairs due to knee pain from the age of eight. This therapist told her mother the girl would be in a wheelchair within two years if she didn't begin corticosteroid therapy. After three infrared sauna treatments, she began to become more agile and subsequently took up folk dancing without the aid of conventional approaches in her recovery.

A clinical trial in Japan reported a successful solution for seven out of seven cases of rheumatoid arthritis treated with whole-body infrared therapy.

These case studies and clinical trials indicate that further study is warranted for the use of whole-body infrared therapy in the care of patients with rheumatoid arthritis.

Other Therapeutic Effects of Infrared Heat

The following information has been summarized from Chapter 9 of Therapeutic Heat and Cold, Fourth Edition, Editors Justus F. Lehmann, M.D., Williams, and Wilkin, is concluded from data gathered there.

Generally it is accepted that heat produces the following desirable therapeutic effects:

1. Infrared heat increases the extensibility of collagen tissue.

Tissues heated to 45°C and then stretched exhibit a nonelastic 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 sessions can produce a 10 to 18 percentage 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. Infrared heat decreases joint stiffness.

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. Infrared heat 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.

4. Infrared heat treatment leads to pain relief.

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.

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 is used for the treatment and relief of pain by over 40 reputable Chinese medical institutes.

5. Infrared heat increases blood flow.

Heating one area of the body produces reflex-modulated vasodilators in distant-body area, 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 vasodilation.

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

6. Infrared heat assists in resolution of inflammatory infiltrated, edema, and exudates.

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

7. Infrared heat affects soft tissue injury.

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.

Chinese Studies Report Positive Effects of Infrared Heat

Researchers report over 90% success in a summary of Chinese studies that assessed the effects of infrared heat therapy on:

- ?? Soft tissue injury
- ?? Lumbar strain
- ?? Periarthritis of the shoulder
- ?? Sciatica
- ?? Pain during menstruation
- ?? Neurodermatitis
- ?? Eczema with infection
- ?? Post-surgical infections
- ?? Facial paralysis (Bell’s Palsy)
- ?? Neurasthenia
- ?? Pelvic infection
- ?? Pediatric pneumonia
- ?? Tinea
- ?? Frostbite with inflammation

Infrared Heat and Coronary Atery Disease, Arteriosclerosis, and Hypertension

Finnish researchers, reporting the regular use of conventional saunas state, “there is abundant evidence to suggest that blood vessels of regular sauna-goers remain elastic and pliable longer due to the regular dilation and contraction” of blood vessels induced by sauna use.

In 1989, German medical researchers reported in “Dermatol Monatsschr” a single whole-body session of infrared-induced hyperthermia lasting over one hour had only beneficial effects on subjects with State I and II essential hypertension. Each subject experienced a rise in core body temperature to a maximum level of 100.5°F. All of the subjects had significant decreases in arterial, venous, and mean blood pressure that lasted for at least 24

hours and linked, according to researchers, to a persistent peripheral dilation effect. An improvement in plasma viscosity was also noted.

Another group of similar hypertensive patients was also studied under the same conditions of hyperthermia, with an eye toward more carefully evaluating the circulatory system effects induced by this type of whole-body heating. During each infrared session, there was a significant decrease of blood pressure, cardiac ejection resistance, and total peripheral resistance in every subject. There was also a significant increase of the subjects' heart rates, stroke volumes, cardiac outputs, and ejection fractions. The researchers site these last three effects as evidence that the stimulation of the heart during infrared-induced hyperthermia is well compensated, while the prior list of effects show clear detail of the microcirculatory changes leading to the desired result of a lowering blood pressure.

Aging and Infrared Heat Therapy

Problems often accompanying have been reported in Japan to be alleviated or reduced by the use of infrared therapy:

- ?? Menopause
- ?? Cold hand and feet (a physical therapist found 20-50% improvement was maintained)
- ?? High blood pressure (in the case of a diabetic a systolic decrease from 180 to 125 and a concurrent 10 pound weight loss)
- ?? Rheumatoid arthritis (7 out of 10 cases resolved in one clinical trial)
- ?? Radiation sickness (relieved signs and symptoms)
- ?? Cancer pain (greatly relieved pain in later stages)
- ?? Sequelae of strokes (Hemiparesis relieved over time)
- ?? Benign prostatic hypertrophy (reduced)
- ?? Duodenal ulcers (eliminated)
- ?? Pain preventing sleep or limiting sleeping positions (relieved)
- ?? Compression fracture pain (pain gone for three days after each treatment in osteoporotic compression fractures)
- ?? Hemorrhoids (reduced)
- ?? Cystitis (gone)
- ?? Cirrhosis of the liver (reversed)
- ?? Gastritis (relieved)
- ?? Hepatitis (gone)
- ?? Asthma, bronchitis (cleared up)
- ?? Chron's Disease (gone)
- ?? Post-surgical adhesions (reduced)
- ?? Leg ulcers (healed when previously static and resistant to other care)
- ?? Keloids (significantly softened and, in some cases, completely gone)

Ear, Nose, and Throat Conditions Relieved with Infrared Heat

In Japan, ear, nose, and throat conditions were relieved with infrared heat treatments:

- ?? Chronic middle-ear inflammation of infection (in one study of chronic serous otitis media no pathogenic bacteria were isolated in 70% of the subjects studied after the use of heat)
- ?? Sore throats
- ?? Tinnitus (chronic severe case cleared with 10 infrared treatments)
- ?? Nose bleeding (reduced)
- ?? Infrared Heat Improved Skin Conditions
- ?? Infrared therapy is used routinely in burn units throughout Asia.
- ?? Skin conditions improved in Japan and China with the use of infrared heat application.
- ?? Nettle rash
- ?? Clogged pores (unplugged of cosmetics, unexcelled skin texture and tone)
- ?? Poor skin tone
- ?? Scars and pain from burns or wounds (decreased in severity and extent)
- ?? Lacerations (healed quicker with less pain and scarring)
- ?? Acne (three to four treatments may open pores that have been malfunctioning for years, forcing out clogging cosmetics, and loosening dry outer skin)
- ?? Teenage skin problems (clearing acne and blackheads)
- ?? Body odor (improved functioning of the skin especially body odor induced by occupational exposure to odorous chemicals)
- ?? Eczema and Psoriasis (respond well)
- ?? Sunburn (According to the Clayton's Electrotberapy, 9th Edition, "infrared radiations are the only antidote to excessive ultraviolet radiations.")
- ?? Ketoids (form at a reduced rate in those prone to their formation and may be softened by infrared heat if they have formed) Dandruff (increased blood flow through the scalp)

Mikkel Aaland's book Sweat (Capra Press, 1978) quotes a Finnish doctor:

"The best dressed foreigner can come into a doctor's office, and when his skin is examined, it is found to be rough as bark. On the other hand, as a result of the sauna, the skin of any Finnish worker is supple and healthy."

hypothalamus gland. The hypothalamus is part of the endocrine system which governs most autonomic bodily functions such as blood pressure, body temperature, breathing, digestion, sexual function, moods, the immune system, the aging process, and circadian rhythm.

For twenty years John Downing, O.D., Ph.D., Director of the Light Therapy Department at the Preventive Medical Center of Marin in San Rafael, California, has been conducting clinical studies on the effects of light. According to Dr. Downing, "We cause or worsen a wide range of health problems by spending ninety percent of our lives indoors under inadequate lighting conditions."

Photo biologist John Nash Ott, D.Sc. (Hon.) is a world renowned research pioneer who is studying the biological affects of light. According to his research, only light which contains the full light wavelength spectrum found in natural sunlight is adequate for maintaining health. In fact, he contends that poor light poses a serious threat to health.

Most artificial lighting, both incandescent and fluorescent, lacks the complete balanced spectrum of sunlight and contributes to a condition that Dr.Ott calls "malillumination." The presence of chronic malillumination, like malnutrition, has a damaging effect on the human body.



For example, if certain light wavelengths are missing in the light we receive, the body can not fully absorb certain nutrients. The result is that, even with adequate nutrition, the body is malnourished without exposure to sufficient light. Dr. Ott believes that malillumination also contributes to fatigue, depression, suppressed immune function, hair loss, skin damage and other maladies.

In a recent study at the Clinical Pathology Department of the National Institute of Health, lack of a balanced spectrum of light contributed to loss of muscle tone and strength. Windows, windshield, eyeglasses, smog, and suntan lotions all filter out parts of the light spectrum and contribute to this problem.



According to leading researcher John Zimmerman, Ph.D., President of Bio-Electro-Magnetics Institute, most offices, even those with uncovered windows and the lights on, have a light level of 1%, only 500 lux of outdoor light, which has about 50,000 lux.

The sun has profound effects on us according to Albert Szent-Gyorgi, Nobel Prize Winner and discoverer of vitamin C.

According to his research light literally can alter the basic biological functions. Numerous other studies provide significant evidence that sunlight produces a metabolic effect in the body similar to that of exercise.

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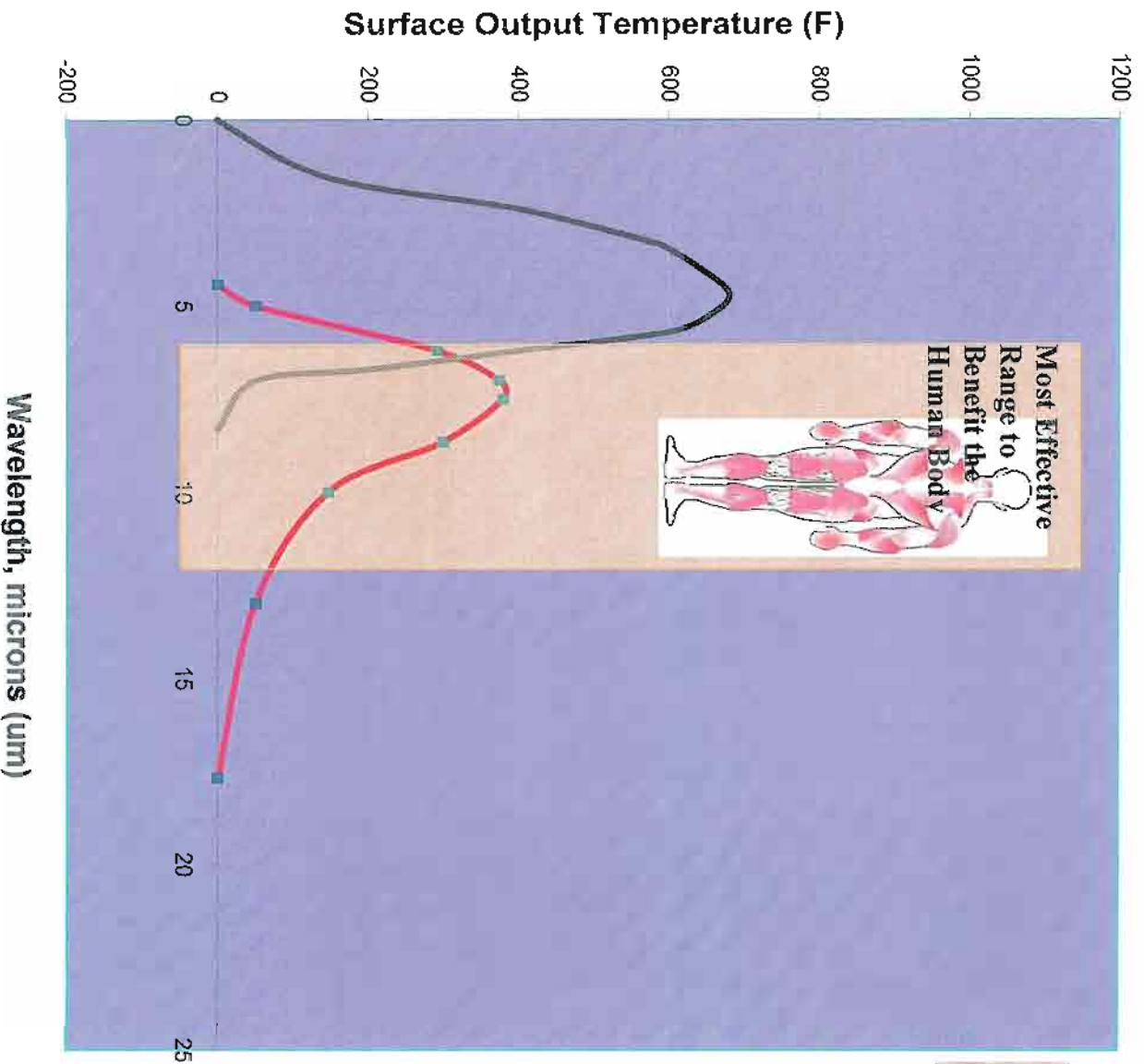
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TheraSauna's™ ceramic Theramitters™ offer lower surface temperature and more effective natural infrared.



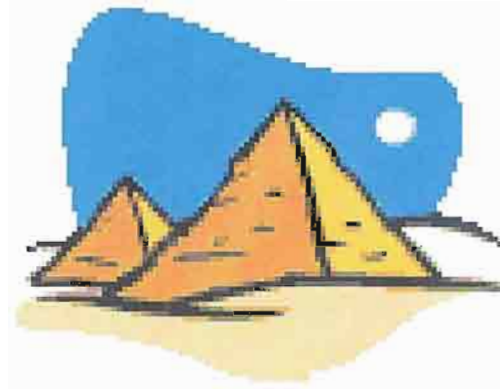
—■ QCA Spas' lower Temperature Ceramic Theramitters™
— High Surface Temperature Heaters (Our Competitors)

The yellow column demonstrates the most effective micron range.

Only QCA's patented TheraSauna™ offers lower surface temperature ceramic Theramitters™ which yield higher light wavelength (microns) similar to those naturally emitted by the human body.

Safer & More Effective

After sunbathing, lactic acid, a by-product of muscle metabolism that causes soreness and stiffness after strenuous exercise, is significantly reduced. Sunbathing also increases the ability of the lungs to absorb more vital oxygen, as well as the blood's capacity to carry and deliver it. Oxygen deficiency has been readily linked to a host of illnesses and discomforts ranging from chronic fatigue to cancer.



Studies conducted by Martinek and Berezin in 1979 found that some wavelengths of light could stimulate certain enzymes to be 500% more effective and other light wavelengths can affect the movement of substances across cell membranes. More recent research shows that sunlight stimulates the thyroid gland to increase its hormone levels, translating into increased metabolism and weight loss. Increased solar energy accelerates the burning of fats, sugars, and toxins.

| Spectrum Of Solar Rays From the Sun | | | | |
|-------------------------------------|--------------|-----------------|----------------|------------------|
| Infrared | Vis | Ultra- | X-Rays | Gamma Rays |
| IR | VIS | UV | X-Rays | Gamma |
| 10 (12) 1 mm | 10 (15) 1 mm | 10 (16) 1000 An | 10 (17) 100 An | 10 (20) .1 An |
| 10 (13) 100 mm | | | 10 (18) 10 An | 10 (21) .01 An |
| 10 (14) 10 mm | | | 10 (19) 1 An | 10 (22) 1 mAn |
| | | | | 10 (23) .1 mAn |
| | | | | 10 (24) .01 mAn |
| | | | | 10 (25) .001 mAn |

Solar energy covers a broad energy band including infrared, visible light, ultra-violet, x-rays and gamma rays. Only a small amount of solar rays are visible as colors. The greatest amount of the sun's energy output is in the infrared segment of the spectrum. This band of light is not visible but can be felt as heat. (Remember how good you feel while lying on the beach.)

The infrared segment of the electromagnetic spectrum is divided into three segments by wave frequencies and light wavelengths. Light wavelengths are measured in microns (mm), which are on millionth of a meters: Far Infrared: 5.6-1000 mm. A narrow spectrum between 14-4 microns has been shown to have particularly beneficial effects on the body.

| Infrared Segments | | |
|--|--------|-------------------|
| Far-Infrared | | Vital-Rays |
| | | Middle |
| | | Near |
| 1000 mm | 5.6 mm | 1.5 mm |
| Infrared Light wavelengths: Far: 1000 mm to 5.6, Middle: 5.6 to 1.5 mm; Near Infrared: 1.5 to 0.76 mm Vital Rays: 4 to 14 microns | | |

Among the total spectrum of solar rays coming from the sun, the FIR waves are the safest and the most beneficial. For example, the visible light spectrum, with very short wave lengths, is reflected away from the body. When near infrared (NIR) waves heat organic substances the surface gets hotter than the interior, and conduction from the surface heats the interior. By contrast, far infrared penetrates deeply with a very uniform warming effect.

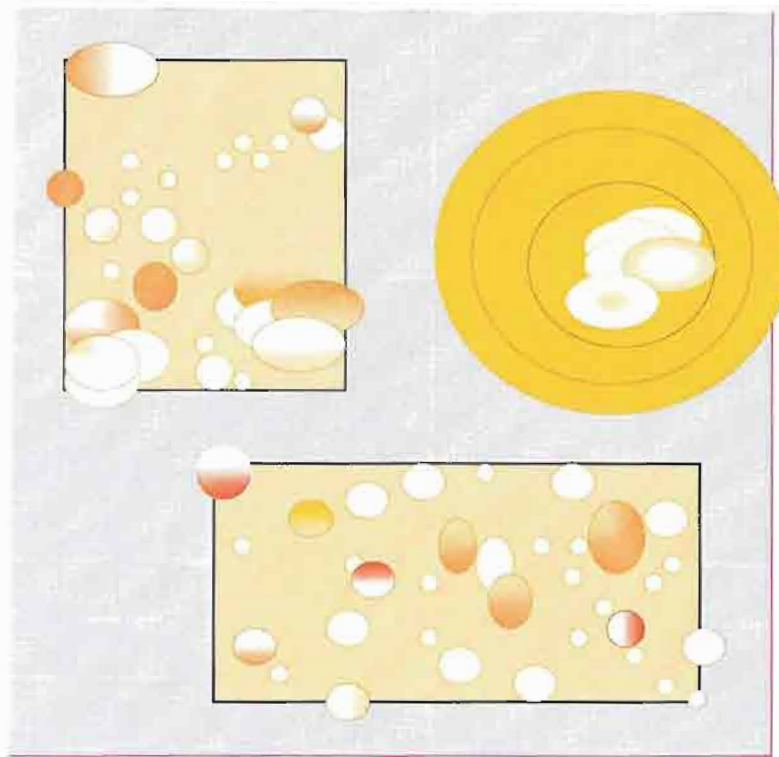
Far Infrared will:

- Increase blood flow by promoting dilation of the micro-circulatory system of capillaries.
- Reduce muscle spasms as muscle fibers are heated.
- Remove toxins
- Improves lymph flow and assists in the reduction of swelling and inflammation
- Reduces soreness on nerve endings
- Stimulates enzyme activity
- Promotes the adhesion and osmosis of water molecules across the cellular membrane
- Attracts calcium ions to the cellular membrane

Since humans are bio-accumulators, numerous toxins that cannot be removed immediately after entry are stored in our bodies. For example, when toxic gases such as sulfur dioxide, carbon dioxide or toxic substances such as lead, mercury or chlorine meets large water molecules, they are encapsulated by the clusters of water. Where these toxins are accumulated, blood circulation is blocked and cellular energy is impaired.

Dr. Toshiko Yamazaki, M.D. owns a clinic in Japan where she has done extensive research on the therapeutic uses of far infrared. In her book, The Science of Far Infrared Therapies, she explains that 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.

However, when a 10micron FIR wave is applied to these large water molecules, the water begins to vibrate. This vibration reduces the ion bonds of the atoms, which are holding together the molecules of water. As the breakdown of the water molecules occurs, encapsulated gases and other toxic materials are released



Scientists in Japan report that in the FIR wave treatment of clogged capillary vessels, a similar process occurs: heat expands the capillaries and then initiates the start of a process to dissolve hidden toxins.

According to Sang Wang, author of Reverse Aging, the Japanese see other uses. Today, over 150 patents have been granted to the Japanese for products such as: FIR saunas, FIR ovens replacing microwaves, FIR panels for incubators in maternity wards as well as FIR wave-generating ceramics and fabrics.

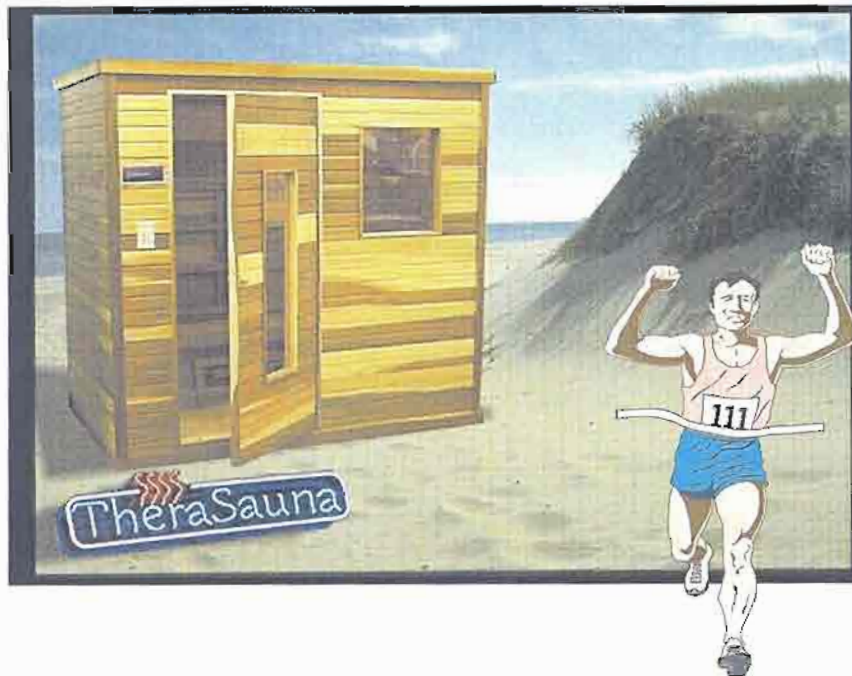
In his summation on the mechanism of action of infrared devices tuned to the human body, Dr. Tau-Tsair Oliver Chi said:

"Tissues needing a boost in their output selectively absorb these rays. The internal production of infrared energy that normally occurs within our tissues is associated with a variety of healing responses and may require a boost to a maximal level to insure the fullest healing response possible in a tissue which is being repaired. After boosting a tissue's level to its maximum, the remaining rays pass onward harmlessly. This phenomenon is called 'resonant-absorption'."

IR Thermal Systems use infrared energy to penetrate the body's tissues to a depth of over 1 ½". Tests have shown that the energy output is tuned so closely to the body's own radiant energy that our bodies absorb close to 93% of the infrared waves that reach our skin. By comparison, conventional saunas must rely only on indirect means of heat: first, on convection and then, conduction to produce its heating effects. The IR sauna operates at temperatures of 110° to 130° F versus 180° to 235° F for hot-air saunas. Since conventional units require 30-90 minutes of warm-up before use, electricity costs are reported to be somewhat higher than those of IR units, which warm up in 5 to 10 minutes.

Medical research has shown a vast number of benefits associated with the use of saunas such as improved circulation, cardiovascular conditioning, muscle relaxation, improve skin conditions and burning of calories.

- **Cardiovascular Conditioning:** As the body works to cool itself, there is a substantive increase in heart rate, cardiac output and metabolic rate. Blood flow during whole-body hyperthermia is reported to rise from a normal 5 to 7 quarts per minute to as much as 13 quarts per minute. In August of 1981 the American Medical Association said "Many of us who run do so to place a demand on our cardiovascular system, not to build big leg muscles. Regular use of a Sauna imparts a similar stress on the cardiovascular system, and its regular use may be as effective a means of cardiovascular conditioning and burning of calories as regular exercise."
- **Caloric Consumption:** "A moderately conditioned person can easily sweat off 500 grams of sweat in a sauna-the equivalent of running two to three miles. While the weight of the water lost can be regained by rehydration with water, the calories will not be." Since IR Thermal systems are reported to help generate two to three times sweat produced in hot-air saunas., in a thirty minute session, the implication is that they may also produce increased caloric consumption.
- **Improved Skin Conditioning:** Increased blood circulation and deep cleansing of impurities improves skin tone and elasticity. Research reports improvements in acne, rashes, burns and skin lesions. Users describe skin as "more youthful and glowing."



QCA Spas, Inc. • 1021 State St. • Bettendorf, IA USA 52722

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Visit our web site at www.qcaspas.com & www.therasauna.com

In conclusion we consider TheraSauna™ to be the only truly effective infrared sauna in the marketplace. Our patented TheraSauna™ is the only one that has:

- ◆ **Patented electronic controls**
- ◆ **Has the full range of light wavelength of between 7.5 and 12 that has been proven that is required to be an effective treatment. The body produces infrared in this range.**
- ◆ **True Far Infrared light wavelength penetration**
- ◆ **Promotes detoxification of heavy metals and all lipophilic toxins.**
- ◆ **Boosts immune and cardiovascular systems**
- ◆ **Relieves pain**
- ◆ **Burns calories (up to 600 in a 25-minute session)**
- ◆ **Has the effect of exercise on the cardiovascular system**
- ◆ **Aids in increasing circulation**
- ◆ **Assembles in 15 minutes**

Other points for your consideration:

- ◆ Plugs into standard household plugs (110 volt)
- ◆ Available in no odor woods
- ◆ Heat penetrates up to 1 ½” into the skin
- ◆ Takes only minutes to warm up
- ◆ Completely portable
- ◆ Costs only pennies a day to operate
- ◆ Needs only 110° F – 130° F compared to traditional west saunas at 180° F-220° F.

According to Sherry A. Rogers, M.D. at Northeast Center for Environmental Medicine and the Author of **Tired Or Toxic?** and **Total Wellness** and an internationally known expert in environmental medicine:

“A sauna used to be thought of as a luxury. But studies now confirm that diet and environmental chemicals cause 95% of cancers. Furthermore, as the first generation of man exposed to such an unprecedented plethora of daily chemicals, we have learned that stored or undetoxified chemicals can mimic any disease. “Incurable” chronic diseases that were thought to have no known cause often disappear once toxic chemicals are gone. Since the far infrared sauna is the **safest, most efficacious** and economical way of depurating stored toxins, this **makes it a household necessity.**”

WARNING!

TheraSauna™ is a serious method of detoxification and, as such, should be used responsibly. Those patients with severe adrenal suppression, Lupus or Multiple Sclerosis should discuss far infrared therapy with their doctor prior to use. Use of far infrared therapy for hemophiliacs is not advised. Pregnant women and nursing mothers should also refrain from using this therapy. If you are under a doctor's care, always consult him/her prior to use. **DO NOT ATTEMPT TO TREAT ANY DISEASE WITH FAR INFRARED THERAPY WITHOUT DIRECT SUPERVISION OF A PHYSICIAN.**

Wood Toxins:

Traditionally saunas used a fire pot with extremely hot coals to heat the air. This can create a fire hazard and therefore most saunas usually were located outside, away from the house. Water is usually poured over the hot coals creating steam and superheating the air which in turn dries out the mucous membranes.

Exposure to the inclement outdoor elements and internal moisture exposure dictated the use of a wood that would hold up under extreme conditions. The wood of choice has usually been cedar or redwood. Both these woods contain a volatile oil called cedrene, which is a member of the terpene family, and cedral, which is a cedar-camphor. While being excellent for providing wood the ability to withstand extreme conditions and the repellent of insect infestations they are adverse to sensitive individuals.

The Terpene group is derived from plants and is unsaturated, aliphatic cyclic hydrocarbons and is an irritant. If ingested can produce gastrointestinal symptoms, aspiration and pulmonary toxicity; absorption has been associated with alteration in mental status ranging from coma to seizures.

Most saunas are now located indoors and operated at lower heat levels. For persons with allergies, multiple chemical sensitivity or those concerned about health problems due to chemical or heavy metal toxicity we recommend our units made from non-odor wood.

Disclaimer:

As you can see, the segment of the infrared spectrum emitted by an infrared sauna, TheraSauna™ is reputed to offer an astounding range of possible therapeutic benefits and effects in research conducted around the world.

However, the data presented in this article is offered for reference purposes only and to stimulate further observation. No implication of TheraSauna™ Far Infrared Sauna from QCA Spas creating a cure for or treating any disease is implied nor should it be inferred. If you have a disease, be sure to consult with a primary-care physician concerning it.

Prescription Drugs: If you are using prescription drugs, check with you physician or pharmacist for possible changes in the drug's effect due to an interaction with infrared energy.

Certain Ailments: According to some authorities, it is considered inadvisable to raise the core temperature of someone with adrenal suppression, systemic lupus erythematosus, or multiple sclerosis.

Joint Problems: If a person has a recent (acute) joint injury, it should not be heated for the first 48 hours or until the hot and swollen symptoms subside. Joints that are chronically hot and swollen may respond poorly to vigorous heating of any kind. Vigorous heating is strictly contradicted in cases of enclosed infections be they dental, in joints, or in any other tissues.

Pregnancy: In pregnancy or the suspicion of pregnancy, discontinuation of sauna use is recommended. Finnish women use traditional saunas that don't heat the body as deeply as an infrared sauna for only six to twelve minutes and reportedly leave at that time due to perceived discomfort. Their usage of traditional saunas at this low level of intensity is not linked to birth defects. Infrared sauna use may be two to three times more intense due to deep tissue penetration, and comparatively shorter two to six minute sessions seem worth any minimal risk they may present.

Surgical Implants: Metal pins, rods, artificial joints, or any other surgical implants generally reflect infrared rays and are not heated by an infrared heat system. Nevertheless, a person should consult his or her surgeon before receiving such therapy. Certainly infrared therapy must be discontinued if a person experiences pain near any implants.

Silicone: Silicone does absorb infrared energy. Implanted silicone or silicone prostheses for nose or ear replacement may be warmed by infrared rays. Since silicone melts at over 200 degrees Celsius, it should not be adversely effected by an infrared heat system, however. It is still advised that a person check with his or her surgeon, and possible of the product manufacturer, to be certain.

Menstruation: Heating of the low-back area of women during the menstrual period may temporarily increase menstrual flow. Once a woman is aware that this is occurring, she