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Popular in parts of Asia and Europe for more than a decade, therapies and healthcare products based on far-infrared technologies are making their way into North America.

WHAT DO KNEE WRAPS, CAPS, QUILTS, MATS, HAIR DRYERS, SOCKS AND SAUNAS HAVE IN COMMON?

If you say they warm you up, you're on the right track. But if you know that all these objects and more are now being designed to radiate far-infrared light--an important energy force that promotes healing--you're among a growing number of people who are onto new techniques in energy medicine.

Perhaps one should say old techniques but new technologies. After all, the body's use of infrared rays is literally as old as our species. Traditionally we've gotten our daily dose of infrared from sunlight, which is composed of all the energy wavelengths in the electromagnetic spectrum (see Quick Definition). Today we're seeing new technologies employing far-infrared energy in healthcare products and in clinical protocols such as hyperthermic therapies for detoxification and cancer treatment (see "Too Hot for Cancer").

Energy medicine is very old, too--at least as old as the first Qigong masters and other ancient practitioners of healing touch therapies. These healers all had in common the ability to emit energy through their hands, and so do many modern day healers, such as Dolores Krieger, Ph.D., R.N., who began teaching healing touch techniques in the U.S. in the 1970s. Contemporary researchers have now proved that these forms of energy medicine use wavelengths in the infrared range.

In a study at the National Yang-Ming Medical College in Taipei, Taiwan, published in the American Journal of Chinese Medicine in 1991, researchers measured the energy Qigong masters emit from their palms. The researchers employed electronic detection equipment but were also able to detect infrared energy by a rise in air temperature near the masters' palms. The study showed that emitted infrared Qi, or Chi (pronounced "chee" and essentially meaning energy in Traditional Chinese Medicine), has positive effects on human fibroblasts, the cells that rebuild connective tissue. The study also showed that infrared Chi stimulated a significant increase in cell growth, DNA synthesis and protein synthesis in cells.

Researchers in Japan have also performed studies of this infrared energy from the human palm, which they call Kikoh. At the Niwa Institute for Immunology in Tosashimizu, Japan, researchers examined Kikoh as well as materials that emit far-infrared radiation, including common granite stone, tourmaline (a type of granite), ceramic disks and hot spring water. In findings published in 1993 in the International Journal of Biometeorology, they reported that materials emitting far-infrared (FIR) energy appear capable of potentiating functions of white blood cells. These functions include increased immune defense response in which white blood cells surround and ingest small living things (such as bacteria) and cell wastes.

There's at least one startling connection between the infrared Chi of healing hands and far-infrared products like the knee wrap. In a situation in which you've pulled a ligament or muscle, for instance, the knee wrap can become the healing hands. Both employ the same healing mechanism: They stimulate a degree of inflammation--a positive sign that fibroblasts are doing their job. Most people don't realize that inflammation is necessary for a period of time to heal such injuries, and they suppress this natural healing process by overusing ice and ibuprofen. Instead, the FIR wrap helps to trigger healing by radiating far-infrared energy through its special ceramic-coated fibers and gently but deeply warming the injury site.

But is this warming effect different from that of a hot water bottle or heating pad? Yes, the vibrational energy of far-infrared light is unlike that of the heat energy we use, for example, in cooking. Think of it as the difference between leaning over a pot of boiling water and standing outside in the sunlight. Steam from boiling water can burn the skin but it doesn't heat internal organs. Sunlight heats us in a profound way, however, because it contains penetrating far-infrared rays as well as the full range of energy in the electromagnetic spectrum.

Everything in the universe emits and absorbs certain wave energies. If we look at a graphic representation of the electromagnetic spectrum (see illustration), we see that infrared waves are longer than those in the visible range, falling just below ("infra") visible red light in the spectrum. Although the wavelengths of far-infrared are too long for our eyes to perceive, we experience the energy as gentle radiant heat.

At the molecular level, FIR exerts strong rotational and vibrational effects that are either biologically benign or, in certain processes, biologically beneficial. This healing ability stands in contrast to the damaging effects of short wavelengths, such as X-rays and gamma rays. The molecular effects of FIR are actually measurable through IR spectroscopy, a method of analyzing the emission and absorption of infrared light that reveals changes in atoms and molecules caused by IR energy. In healthcare, these effects are being harnessed to promote healing.

Humans, like other living organisms, have evolved to have a unique absorption spectrum and to respond specifically to particular electromagnetic wavelengths (EMWs). German professor Fritz Hollwich, Ph.D., conducted a study in the 1970s showing that individuals who sat under cool-white fluorescent lighting had elevated levels of the stress hormones ACTH and cortisol. There was no such stress response in individuals who sat under full-spectrum lights that simulated sunlight. (As a result of studies like this, the fluorescent lights are legally banned in German hospitals and medical facilities.) Dr. Hollwich's study is one of many that have shown that light has stimulatory and regulatory effects on biological systems.

Far-infrared light penetrates beyond the skin level and is absorbed efficiently by cells below, whereas visible light is mostly bounced off the skin surface. Near-infrared is mostly absorbed at the skin level and raises the skin temperature. Far-infrared can penetrate up to 4 centimeters (about 1-1/2 inches), exciting the vibrational energy of molecules and resonating with cellular frequencies. We can't exactly perceive the deep heating effects of FIR, though, because our body's ability to sense heat is mainly at the skin level. Nonetheless, the effects of FIR rays promote bioprocesses such as increased metabolism and blood circulation, and can raise core body temperature. NASA certainly understood some of these effects when it developed FIR materials for radiant heat during space travel. Hospitals have also taken advantage of some of these properties to keep newborn babies warm using FIR materials around incubators.

Studies have been done--predominantly in Asia and Europe over the past few decades--to advance the understanding of FIR in bioprocesses. A fundamental finding from classical studies is that FIR appears to have "normalization effects" on living organisms. In a recent study at the Experimental Animal Research Laboratory at Meiji University in Japan, researchers found that mice in a group exposed to FIR had a significantly higher survival rate than that of the control group.

WRAPS FROM HEAD TO TOE--AND MORE

Wraps are just one of many types of FIR healthcare products popularized over the last decade in Asian countries. Of course, you might not warm up to all the health claims until you fully absorb the principles of FIR or try a self-care product yourself. But as Dr. Silverstone explains, "The mechanism of action is in some ways simple. It is related to vasodilation, or increased blood flow and local temperature. The penetrating infrared energy brings nutrients and oxygen to the soft tissue region being treated and at the same time stimulates the removal of accumulated toxins. Also, far-infrared has an ionizing effect. The many studies of the relationship between negative ions and health have shown that these effects are beneficial."

Far-infrared (FIR) wraps can be used to promote localized healing in different parts of the body. The wraps radiate far-infrared energy through their special ceramic-coated fibers, thereby gently but deeply warming the injury site.

Some FIR products are already available in North America, while the list used in Asia is quite long. It includes waist protectors to reduce stomachache, menstrual discomfort, chronic intestinal inflammation, baby diarrhea and stomach cold caused by kidney weakness; underwear to reduce prostatitis, vaginitis, hives (urticaria), psoriasis and jock itch; socks to get rid of foot aches, offensive smell, sweaty feet and phlebitis; and caps to reduce dandruff, high blood pressure, nervous exhaustion and migraine. There are also "thermowear" FIR long johns and vests filled with ceramic-reflective materials that, if not yet proven therapeutic, will surely keep you warm.

But that's not all. FIR brassieres have been invented to help eliminate mastitis (inflammation of the breast) and to improve lymph circulation and lactation. At the Osaka City Perinatal Center in Japan, the vasodilating and warming effects of far-infrared energy on the breast were studied. The researchers reported their results in the *Annals of Physiological Anthropology* in 1990, concluding that "ceramics far-infrared radiation may be an effective remedy for enhancing lactation."

There are even quick-cooking FIR ovens that replace microwave ovens and are said to kill E. coli bacteria. Some years back there began experiments with different IR spectra used to kill harmful microorganisms. This has translated into several healthy household products--including FIR-coated plates that kill bacteria, FIR-emitting paints and wallpaper that kill molds, and FIR shower filters. "The filters use FIR emissions combined with Paragon's filtration technology to keep chlorine from forming harmful vapors and also to prevent soap scum build-up on shower walls," says Fred Slingo. "The shower filter is actually a water treatment device that removes undesirable substances and reduces the surface tension of the water, which allows a complete rinse and has a much less drying effect on the skin and hair."

Then there are the "bioenergetic" FIR mattresses, mats and quilts, which have been said to clear up insomnia, fatigue, menopausal symptoms, high blood pressure, thrombus and arteriosclerotic occlusions and more. In a study by Japanese researchers S. Inoue and M. Kabaya, published in 1989 in the *International Journal of Biometeorology*, questionnaires were sent to 542 users of bedclothes with embedded FIR radiator disks (the ceramic disks that emit FIR in the 4 to 16 micron range). The majority of respondents said they saw an improvement in their health. The researchers concluded that "these effects on living organisms appear to be non-specifically triggered by an exposure to far-infrared rays, which eventually induce an increase in temperature of the body tissues or, more basically, an elevated motility of body fluids due to decrease in size of water clusters."

Another device for localized treatment is a lamp on a stand. It's called the TDP Far-Infrared Therapeutic Lamp, and it can provide focused deep heating in therapeutic treatments such as those to increase blood circulation and metabolism. Clinical studies have shown some of the following

benefits: decreased inflammation and edema from soft tissue injuries; relief of pain, including arthritis pain; promotion of circulation and healing; healing of skin disorders; and balancing of the nervous system.



For many, the biggest news in FIR technology is its application in the evolving science of detoxification, and the device being used is the far-infrared sauna. At home and in clinics, these saunas are said to yield many benefits--including relief from different kinds of pain; stimulation of immune response; improvement in skin tone and conditions such as burns, eczema and acne; and the accelerated burning of calories. But the detox application is health news that can benefit everyone. "Traditional wisdom has suggested that saunas work largely by promoting detoxification through the sweat," says John C. Cline, M.D., B.Sc., C.C.F.P., A.B.C.T., Medical Director of the Cline Medical Centre and Oceanside Functional Medicine Research Institute, located on Vancouver Island, British Columbia, Canada. "Saunas also stimulate cells to release toxins which can then be eliminated by the liver and bowel. Several published studies have now shown that this hyperthermic therapy can bring about the rapid removal of a wide range of toxic substances from the human body."

The FIR energy emitted in these saunas may induce two or three times the sweat volume of conventional saunas, yet they operate at a much cooler air temperature range: about 110 to 130 deg F, compared with 180 deg F to 235 deg F in a conventional sauna. Many individuals who cannot tolerate a conventional sauna, steam room or sweat lodge will find FIR saunas pleasant. The lower heat range is also safer for those with cardiovascular risk factors or fragile health because lower temperatures don't dramatically elevate heart rate and blood pressure.

Dr. Cline points out that methods to induce sweating have been used for centuries to bring about improved health and relief from disease. "Over 2,000 years ago," he says, "the famous Greek physician, Parmenides, stated 'give me a chance to create fever, and I will cure any disease.' This traditional wisdom has certainly stood the test of time. Using methods ranging from hot mineral baths and sweat lodges to saunas and steam baths, individuals have enjoyed the revitalizing effects of induced hyperthermia--the artificial elevation of body temperature.

Environmental medical specialist Doris J. Rapp, M.D., of Scottsdale, Arizona, a well-known pediatrician, allergist, homeopath and past president of the American Academy of Environmental Medicine, states unequivocally, "Everybody in this country needs to be detoxified because we've all become 'toxic dumpsites.'" Dr. Rapp began using a far-infrared sauna personally after seeing a similar procedure being employed in a German clinic. She was impressed with the clinic's work in detoxifying young children and infants. Dr. Rapp affirms that her FIR sauna causes her to perspire profusely, and she adds, "I'm hoping to see more patient outcome studies on FIR sauna use--studies that will further evaluate the efficacy of this treatment and impartially evaluate the various saunas."

Hyperthermic detoxification using these saunas is not only uniquely helpful in removing fat-stored toxins from the body but also as an adjunct to mercury removal. Dr. Dietrich Klinghardt, M.D., of Seattle, who has been called "the holistic doctors' doctor and teacher," is one of the pioneers in combining the use of FIR saunas with the chelating agent DMPS in a heavy metal detox protocol.

Dr. Cline explains, "Given that hyperthermic sauna therapy removes metal contaminants from the body by a different mechanism than chelation therapy mechanism than chelation therapy we have found that it may be used to further the benefits derived from chelation therapy. And we have also found that it may be an alternative for those who are unable to undergo chelation.

How Do You Know If You Need Detoxification?

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 overload include fatigue, headaches, joint or muscle pain, frequent colds and flus, 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. To set up an appropriate detox regimen, consult a physician.

'Research conducted by U.S. scientists has demonstrated that close to 80,% of individuals with chronic fatigue syndrome will improve markedly by a guided detoxification program. The program involves nutritional organization of detoxification using a low-energy diet and UltraClear Plus, a medical food product designed at the Functional Medicine Research Center in Washington. This approach, called 'enterohepatic resuscitation,' is being used by healthcare practitioners around the world. We combine this approach with hyperthermic therapy using the far-infrared sauna, as well as exercise and chelation. The results we are seeing are very promising.

Dr. Rapp adds, "If far-infrared saunas work, why wait to use them? In our homes and healthcare facilities, we need to use these saunas to detox the same way we exercise-safely and effectively. People need information about what nutrients and minerals to take, how to stay hydrated, and a reminder to shower after the sauna. It's not going to do much good to spend time detoxing if you don't wash off those toxins afterwards. And don't overlook the importance of educating yourself and your children about sources of environmental toxins and allergens. Your future health depends on it!"