

# FAR INFRARED

## WHAT IS FAR INFRARED (FIR)

It is a specific wave length of light from the sun. Among the rays coming from the sun, the FIR waves are the safest and the most beneficial.

What exactly is radiant heat? No need to worry - it has nothing to do with either ultraviolet radiation (which gives you a sunburn and damages your skin) or atomic radiation (the kind from a nuclear bomb). Radiant heat is simply a form of energy that heats objects directly through a process called conversion, without having to heat the air in between. **Radiant heat is also called infrared energy (IR).** The infrared segment of the electromagnetic spectrum is divided into three segments by wave length, measured in microns or micrometers (a micron = 1/1,000,000 meter); .076-1.5 microns = near or close; 1.5-5.6 = middle or intermediate; 5.6-1000 = far or long-wave infrared. The infrared segment of the electromagnetic spectrum occurs just below or “infra” to red light as the next lowest energy band of light. This band of light is not visible to human eyes but can be seen by special cameras that translate infrared into colors visible to our eyes. We can, however, feel this type of light which we perceive as heat.

**Our sun produces most of its energy output in the infrared segment** of the spectrum. Our atmosphere has a “window” in it that allows FIR rays in the 7-14 micron range to safely reach the earth’s surface. When warmed, the earth radiates infrared rays in the 7-14 micron band with its peak output at 10 microns.

**The sun is the principal source of radiant energy** that we experience daily. Have you ever been outside on a partly cloudy spring day of about 50 degrees and felt quite comfortable until suddenly the sun was obscured by a cloud? Although the air temperature had not had time to drop, you felt chilled, as the cloud would not let the warming infrared rays through to reach you. **The infrared heat in the Hot House is just like the heat from our sun or that which our own bodies produce as they burn fuel to keep us warm. These rays are selectively absorbed by the tissues needing a boost in their output.** The internal production of infrared energy that normally occurs within our tissues is associated with a variety of healing resources. After boosting a tissue’s level to maximum, the remaining rays pass onward harmlessly. This phenomenon is called “resonant absorption.”

## WHAT DOES IT DO

- **Elevates the temperature of subcutaneous layers**, thus expanding blood capillaries, stimulating blood circulation, increasing metabolism between blood and tissue, promoting tissue regeneration and reducing cramping.
- **Penetrates 4-5 centimeters into the dermis** (middle layer of skin) from muscles into blood vessels, lymphatic glands and nerves.
- **Affects every living cell and produces warmth.** Through this cell tissue's "micro-friction" and the vibration of molecular resonance, chemicals within cells are activated.
- **The warming effect is helpful in eliminating** such things as the waste products generated by aging, heavy metals and toxic substances, which are then secreted by the sweat and dermis-layer fat glands.
- **Adjusts the autonomic nerve function** and reduces the over-stimulation of sensory nerves.

## HOW THE PROCESS EVOLVES

- FIR waves reach into the cell and create water molecule resonance
- The waves then produce atomic molecule resonance
- Energy conversion occurs through absorption
- It forms an effect on the heart
- It enters to the subcutaneous cell layer
- Temperature is elevated
- Capillary dilation takes place
- Extravasated blood and congested toxins are excreted
- Cells are activated
- Organ cells are repaired and protected
- The formation of enzymes is promoted

When FIR penetrates our bodies it can be converted into the appropriate energy. This **activates the self-regulating systems in our living tissue** so as to alleviate the bodily imbalance and lead to recovery. It is not only a beneficial health therapy, but can also be a substitute for other therapeutic modalities. Because of its heat penetration property, FIR radiates to the meridian points of the body.

Treatments generally last 20 minutes to an hour, but it does not hurt to use it longer. Initially, relief is only temporary, but with repeated treatments the duration of relief becomes longer and eventually becomes lasting.

Today, scientists and physicians are studying specific wavelengths of light, such as Far Infrared, to understand their therapeutic effects on our bodies. 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.

If certain wavelengths are missing in the light we receive, the body cannot fully absorb certain nutrients. The result is that, **even with adequate nutrition, the body is malnourished without exposure to sufficient light.** Sunlight 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.

When near infrared (NIR) waves heat organic substances the surface gets hotter than the interior, and the interior gets heated by conduction from the surface. By contrast, far infrared (FIR) penetrates deeply with a very uniform warming effect. Recent studies show that not enough illumination contributes to fatigue, depression, suppressed immune function, hair loss, skin damage. Lack of a balanced spectrum of light contributed to loss of muscle tone and strength.

#### **FAR INFRARED DOME BENEFITS**

- Far Infrared emits **photons**
- Photons help release **enzymes**
- Enzymes stimulate **macrophage** activity increasing the elimination of **damaged and diseased tissues**
- Nitric **oxide** is released which **expands capillaries** and **increases circulation**

Infra-red photons produce enzymes that activate macrophages, which help eliminate damaged and diseased tissue. Macrophages work on a cellular level.

Nitric oxide is released and expands capillaries. It also increases circulation and carries toxins to the lymph system and out of the body.

Why is this Infrared system unique? It uses infrared radiant energy to directly penetrate the body's tissues to a depth of over 1-1/2". Its energy output is tuned to correspond so closely to the body's own radiant energy that our bodies absorb close to 93% of the infrared waves that reach our skin.

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.

Numerous toxins are stored in our bodies. Toxic gases may be encapsulated by clusters of water. Where these toxins are accumulated, blood circulation is blocked and cellular energy is impaired. When a 10 micron FIR wave is applied to these large water molecules, the water begins to vibrate, which 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.

## RESEARCH

Dr. Tsu Tsair Oliver Chi summarized **the effect of infrared rays on the body** in these words, "These rays are selectively absorbed by tissues needing a boost in their output. 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 ensure 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."

Success reported with Infrared treatments by Japanese researchers in **Musculoskeletal cases:**

TMJ	Accel-Decel Injury Sequelae
Traumatic Arthritis	Brain Contusion -accelerated healing
Low Back Pain relieved	Muscle Spasms -reduced or eliminated
Disc Protrusion-related Neuralgia	Brain Contusion -accelerated healing
Tight Shoulders -relaxed	Muscle Tension -relaxed
Bursitis -eliminated	Shoulder Pain -relieved or eliminated
Spinal Cord Shock -reversed	Post-exercise Muscle Pain
Arthritis: Gouty, Rheumatoid - each substantially relieved or improved	

"**Medical practitioners** make use of Infrared radiant heat to treat sprains, bursitis, peripheral vascular diseases, arthritis and muscle pain," according to McGraw-Hill Encyclopedia of Science and Technology.

Summary from Therapeutic Heat and Cold, 4<sup>th</sup> Ed., ED Justus F. Lehmann M.D.

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

- 1. It increases the extensibility of collagen tissues.**
  - Tissues heated to 45 C exhibit an increase of length in tissues when stretched.
  - This effect would be especially valuable in working with ligaments, joint capsules, tendons, fascia and synovium that have become scarred, thickened or contracted.
  - Such stretching at 45 C caused much less weakening in stretched tissues than a similar stretching at normal temperatures.
  - The experiments cited clearly showed that low-force stretching can produce significant residual elongation when heat is applied together with stretching or range-of-motion exercises, and is also safer than stretching tissues at normal tissue temperatures.
  - This safer stretching effect is crucial in properly training competitive athletes so as to minimize their "down" time from injuries.
- 2. It decreases joint stiffness directly.**
- 3. It relieves muscle spasms.**
- 4. It produces pain relief.**
- 5. It increases blood flow.**

6. **It assists in resolution of inflammatory infiltrates, edema and exudates.**
7. **More recently, it has been used in cancer therapy.**

Otto Warburg was nominated for the Nobel Prize in 1944 for research concerning photosynthesis in connection with the chemotherapeutics of cancer and the use of x-rays. His research has shown that infrared impacts cancer.

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

Whiplash	Menopause	Shoulder stiffness
Rheumatism	Sciatica	Arthritis
Insomnia	Acne	Ear diseases
Gastroenteric problems		

Researchers reported **over 90% success** in a summary of Chinese studies that assessed the effect of Infrared on:

Soft tissue injury	Lumbar strain	Sciatica
Eczema with infection	Cholecystitis	Pelvic infection
Tinea	Neurodermatitis	Diarrhea
Neurasthenia	Pediatric pneumonia	Menstrual pain
Periarthritis of the shoulder		Post-surgical infections
Facial paralysis (Bell's Palsy)		Frostbite with inflammation

**Far Infrared produces nitric oxide.** (White cells use nitric oxide to defend against tumors. Nitroglycerine and other related compounds act by releasing nitric oxide.)

The scientific mechanism of FIR was strongly suggested in the 1998 Nobel Prize in Medicine Award. Scientists Murad, Furchgott and Ignaro found that nitric oxide gas, which is released into the blood from the hemoglobin, turns on the immune system and allows healing to take place. Dr. Valentino Fuster, a past president of the American Heart Association, called the nitric oxide discovery "one of the most important discoveries in the history of cardiovascular medicine because it promotes expansion of the capillaries and allows the blood to get into the area to increase circulation and reduce the risk of strokes and heart attacks."

It has been demonstrated by Dr. Lon R. Horwitz that a FIR energy modality increases nitric acid in the blood and plasma of normal adult subjects. A 1999 publication by Dr. Horwitz strongly suggests that Far Infrared produces nitric oxide gas, which aided in the recovery of the five patients in a study, who could not get healing conventionally. They had various diabetic problems and were not able to heal, but they received the nitric oxide technology produced by the FIR, and healing took place for all of them. Augmentation of Wound Healing Using Monochromatic Infrared Energy; Advances in Wound Care; author's unpublished research.

When you apply the FIR technology, you see the healing results from the production of nitric oxide from the hemoglobin by the reaction of the photons of the FIR on the enzymes, which produce the nitric oxide gas. The immune cells get into the area and the circulation is increased. Pain is reduced, and the area now has the immune cells necessary to get complete healing.

The wide-ranging **results of nitric oxide** may pay off in new treatments for:  
Atherosclerosis (a thickening of artery walls)  
Septic shock (a dangerous drop in blood pressure)  
Cancer

The Infrared protocol was instituted after conventional management protocols were shown to be ineffective in **wound healing**. The rate and quality of healing of these previously refractory wounds, following use of FIR energy, may be related to local increases in nitric oxide concentration. Increases in nitric oxide previously have been demonstrated to correlate with vasodilatory and anabolic responses.

**Substances harmful to the human body are excreted through sweat and oil glands,** such as  
carcinogenic heavy metals, toxic substances from food processing, lactic acid, nonesterified fatty acids, fat and subcutaneous fat which cause fatigue and aging, as well as hypertension caused by sodium ions which trigger uric acid pain.

## **FIR HEAT IS FELT TO PRODUCE THERAPEUTIC EFFECTS IN THE FOLLOWING:**

### **BRAIN**

Short-term memory improved                      Accelerated repair in brain contusions  
Cerebral hemorrhages - healing both speeds up and is significantly enhanced

### **COLLAGEN TISSUES**

Ligaments	Joint capsules	Tendons
Fascia	Synovium	Increases range of motion
Scarred, thickened or contracted tissues		
Increases extensibility of collagen tissues		

### **BODY ACIDITY**

Reduces acidity in the body (FIR causes fruit to ripen faster by reducing acidity)

### **NERVES**

Neuresthenia                                      Adjusts autonomic nerve function  
Reduces over-stimulation of sensory nerves

## CELLS

Attracts calcium ions to the cellular level

Promotes adhesion and osmosis of water molecules across the cellular membrane

Stimulates enzyme activity

## JOINTS

Assists in reduction of swelling and inflammation by improving lymph flow

Decreases joint stiffness directly

## PAIN RELIEF

Neuralgia

Headache

Pain during menstruation

May lead to increased endorphin production, which reduces pain

## CONDITIONS AFFECTED BY CIRCULATION

Increases blood flow by promoting dilation of capillaries

Clogged capillary vessels

Hypertension

Arteriosclerosis

High blood pressure

Low blood pressure

Coronary artery disease

Arthritis

Sciatica

Backaches

Hemorrhoids

Nervous tension

Diabetes

Varicose veins

Neuritis

Bursitis

Rheumatism

Strained muscles

Fatigue

Stretch marks

Menstrual cramps

Upset stomach

Piles

Poor peripheral circulation

## CARDIOVASCULAR

Atherosclerosis (thickening of artery walls due to fatty deposits)

Septic shock (dangerous drop of blood pressure)

Due to the deep penetration over 1-1/2" into the skin of the infrared rays generated by the FIR dome, there is a healing effect deep in the muscular tissues and the internal organs. The body responds to this deep healing affect as a hypothalamic-induced increase in both heart volume and rate. 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. As the body works to cool itself, there is a substantial increase in heart rate, cardiac output and metabolic rate, and blood flow rises.

## INFLAMMATORY INFILTRATES, EDEMA AND EXUDATES

Edema of the joints

Inflammation of joints

Tendinitis

Sprain

Joint stiffness

Peripheral Occlusive Disease

Gout

Speeds up healing - treatment with infrared has been so successful that hospital stays were reported to have been reduced by 25%.

## CANCER

Cancer therapy                      Cancer of the tongue  
Radiation sickness - relieves signs & symptoms  
Cancer pain - relieved in later stages of cancer  
FIR heat can penetrate through the body and kill cancerous cells

Cancerous cells cannot exist if blood circulation is smooth. Good circulation in the capillaries leaves no room for a cancerous cell to settle down. (A cancerous cell has to settle down so it can proliferate.) **FIR helps capillaries to expand, improving circulation.** The cancer cell also has a weakness: heat above 42 deg C can kill it. FIR heat can penetrate through the body and kill cancerous cells. FIR treatment raises body temperature. FIR therapy can alleviate pain and prolong life when conventional cancer treatment fails. Surgery, radiotherapy and chemotherapy are considered detrimental to health - they are invasive treatments. FIR therapy and immuno-therapy are regarded as non-invasive. FIR is extremely beneficial.

## DENTISTRY

Dr. John Tate, DDS, says, "I have used the FIR dome with over fifty high risk surgical cases without complication or dry sockets on 92% of the patients. The dome is placed over the patient in my office a half hour before surgery and then a half hour after surgery to promote an immune response. The patient then takes the dome home and applies the technology at home for two hours a day for the next three days. They get what we call complete healing. The macrophages produce collagen necessary to stimulate the fibroblasts, and the tissue of the fibroblasts then will stimulate the osteoblast, which is bone. That is where the bone forms - and it starts in the first three days - but it takes about six months for complete healing. The two main cells we need in dentistry and in surgery around the bone area are the **macrophages** and the **neutrophils.**" (which are **activated by far infrared heat**).

"The macrophage is called the "pac man" of the immune system. The macrophage is a cell that engulfs and digests microorganisms. Everything starts with the macrophage - "macro" meaning big and "phage" meaning eater. So we have a big eater here. The tentacle on the macrophage grabs the staphylococci and a bacillus rod, and that macrophage extends a pseudo paw to get the bacteria that is now invading our blood!"

**I elected to use the FIR dome for these reasons:**

1. **Safety.** The FIR produces a wave length that is identical to the body's own wave length by body heat, and that is at the 8-to-10-micron level, so it is safe.
2. **Penetration.** FIR penetrates 1-1/2" so this is an advantage to the dental surgeon who deals with bone as well as soft tissue.
3. **Area covered.** The unique ceramic construction of the FIR dome covers a large area of the body, with a large coverage in a short period of time. Since there is a 160-degree angle, the penetration and the intensity of the dome produces a strong effect.

4. One hour's use of the FIR dome for five days would produce a large body production of nitric oxide gas. It will also increase circulation, reduce pain and swelling and promote faster healing. That has been my observation with about 50 patients now. They tell me, 'Doc, I don't need any more antibiotics; I am healing; I feel good; I don't have any swelling.'"

**IMMUNE SYSTEM**

Pelvic infection	Post-surgical infection
Toe-and-finger-nail fungus	
Scleroderma (an autoimmune disease where collagen builds up and healing cannot take place because the circulation can't get to the area due to the buildup of the collagen)	

Infrared energy appears capable of potentiating functions of white blood cells. More white blood cells means greater immune function and resistance to disease and viruses.

There is an immune response facilitated by the photons of the FIR technology that turns on the enzyme system, particularly the nitric oxide synthase enzyme. It is well established medically that this is the mechanism involved in the FIR technology.

**PROBLEMS THAT OFTEN ACCOMPANY AGING**

Menopause	Cold hands & feet	High blood pressure
Rheumatoid arthritis	Radiation sickness	Sequelae of strokes
Leg ulcers	Rheumatism	Insomnia
Benign prostatic hypertrophy		Pain which affects ability to sleep
Pain from a metal joint implant		Speeds healing of joint implants
Compression fracture pain		

**DISEASES OF ORGANS**

Duodenal ulcers	Hepatitis	Gastritis
Cirrhosis of liver	Hemorrhoids	Asthma
Bronchitis	Crohn's Disease	Post-surgical adhesions
Cystitis	Heartburn	Nephritis
Gastric and duodenal ulcers	Stomach ache	Gastroenteric
Reduces density of uric acid	Cholecystitis	

**EAR, NOSE, THROAT CONDITIONS**

Sore throats	Earache	Nosebleeds
Tinea		
Chronic middle-ear inflammation & infection		
Tinnitus - chronic, severe case cleared with 10 FIR treatments		

**RESPIRATORY**

Chest colds	Bronchitis	Pneumonia
-------------	------------	-----------

## **SKIN CONDITIONS**

Clogged pores.	Poor skin tone.	Open wounds
Laceration	Body odor	Loosens dead outer skin
Eczema	Psoriasis	Aging skin
Chapping	Chillblains	Frostbite
Rashes	Removes roughness	Improves skin tone
Nettle rash	Neurodermatitis	

Leg & Decubitus **ulcers** improved when previously resistant to other care

**Dandruff** - due to increased blood flow through the scalp

**Burns** - Scars and pain from burns and wounds are decreased in severity and extent. FIR therapy is used routinely in burn units throughout Asia.

**Keloids** - significantly softened and in some cases completely gone

**Acne** - FIR may open pores that have not been functioning in years

**Sunburn** - FIR radiations are the only antidote to excessive ultraviolet radiation, according to Clayton's Electrotherapy, Ninth Ed.

## **MUSCULOSKELETAL**

Arthritis	Accel-decel injury sequelae	Brain contusion
Lumbago	Relieves muscle spasms	TMJ arthritis
Cramping	Whiplash	Lumbar strain
Muscle tension	Spinal cord shock	Post-exercise muscle pain
Bursitis	Muscle spasms	Knee injuries
Paralysis	Sciatica	Neuralgia

Abnormal nerve functions  
Back, shoulder, neck and muscle pain  
Facial paralysis (Bell's Palsy)  
Reduces muscle spasms as muscle fibers are heated  
Great for warming up before exercise

## **SOFT TISSUE**

Soft tissue injuries - promotes relief in chronic cases	Accelerated healing in newer injuries
Auto accident-related soft tissue injury	Cellulite

Aids in regeneration of tissue  
Reduces soreness through direct action on nerve endings in tissues and on periphery

## **WEIGHT LOSS**

Direct excretion of fat.	Burns calories	Increases metabolism
--------------------------	----------------	----------------------

Weight loss can come through the energy use needed to produce sweating

Cellulite (a gel-like substance made up of fat, water and wastes, which are trapped in pockets below the skin) A FIR dome will assist this condition, as profuse sweating helps clear it from the body. FIR heat can be significantly more effective than other heat methods, due to the heat penetration being twice the depth into cellulite.

As a FIR dome is an unsurpassed expeller of toxins, it is also a great way to get rid of any fat our bodies are using to dilute toxins we are storing.

Two of the highest caloric output forms of exercise are rowing and marathon running. Peak output in these sports burns about 600 calories in 30 minutes. Infrared use may better this effect by burning some 900 calories in a 30-minute session. Thus Infrared might stimulate the consumption of energy equal to that expended in a 6.9 mile run during only a single session.

The cleansing and purifying benefits attributed to the traditional sweat lodges are now available for daily purification without the time-consuming set-up process that a sweat lodge requires.

### **EXERCISE AND CONDITIONING EFFECT**

An infrared system can play a pivotal role in both weight control and cardiovascular conditioning. The Infrared dome makes it possible for people in wheelchairs, or those who are otherwise unable to exert themselves or who won't follow through on an exercise and conditioning program to achieve a cardiovascular training effect. This also allows for more variety in any ongoing training program. **“Regular use may be as effective, as a means of cardiovascular conditioning and burning of calories, as regular exercise.”**

For athletes, the FIR dome helps the oxygen-debt to be repaid more quickly. The FIR dome is great for warming up before stretching or starting any vigorous activity. Allow the FIR rays to pour right through your clothing until you just begin to break a sweat. Now you are pre-warmed for stretching, running, skiing in cold weather. This should help to prevent injuries.

## CASE STUDY

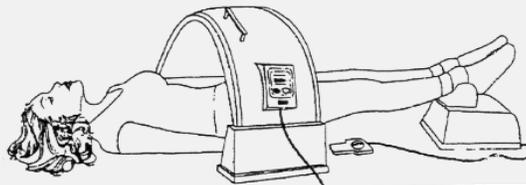
**Rheumatoid arthritis** in a 14-year-old Swedish girl who couldn't walk comfortably downstairs due to knee pain since she had been eight years old. Her rheumatologists told her mother that she would be in a wheelchair within two years. However, **after three infrared treatments she began to become more agile and subsequently took up folk dancing**, without the aid of the conventional approach in her recovery.

## CAUTION

If you have a disease or are using any prescription drugs, be certain to consult with a primary-care physician before use. Some authorities consider its use inadvisable with systemic lupus, erythematosis, chronically hot and swollen joints, enclosed infections, predisposition to hemorrhage, multiple sclerosis, or during pregnancy. If you have a recent (acute) joint injury it should not be heated for the first 48 hours after an injury. If you have metal pins, rods, artificial joints or other surgical or silicone implants, consult your surgeon prior to using FIR. (Metal pins, rods, etc. generally reflect infrared rays.) FIR use must be discontinued if you experience pain near any implants. Heating of the low back area of women during the menstrual period **may** temporarily increase their menstrual flow.

The data presented herein is offered for reference purposes only and to stimulate further observation. No implication of Infrared to cure or treat any disease is implied nor should it be inferred.

## Far Infrared Dome



### 160 Degree Heating Surface

The patented "Super Radiant Heating Surface" is covered with a very fine multi-faceted acute-angle silicon surface. The rays are scattered in all directions by the countless surfaces created by the silicon crystals. This amplifies the effectiveness of the radiant transmission area by some 10-fold. It wouldn't be possible to generate the levels of FIR energy necessary for effective results without this combination of proper wavelength and our special reflective silicon surface.



## Warming Up to Far Infrared

### References

- Infrared's Effect on Dentistry and the Immune System, John L. Tate, DDS.  
Far-Infrared - Technologies That Harness the Sun, Valerie H. Free, Complimentary Healing.
- Warming up to Far-Infrared, D.J. Fletcher, Alternative Medicine, Jan. 2001.
- Infrared Thermal System, Dr. Aaron M.Flickstein, Thermal Life Infrared.
- The Healing Rays of Far-Infrared, Hsin Ten Enterprises.
- Augmentation of Wound Healing Using Monochromatic Infrared Energy, Lon R.Horwitz, DPM, CWS; Thomas J. Burke, PhD; Dale Carnegie, DPM, Advances in Wound Care, Jan./Feb.1999.
- Medical Report, HotHouse FIR Health Builder.
- Clayton's Electrotherapy, Ninth Ed.
- Therapeutic Heat and Cold, 4<sup>th</sup> Ed, ED, Justus F. Lehmann, M.D.
- The Science of Far Infrared Therapies, Toshiko Yamazaki, M.D.