CRPS has two forms:

- **CRPS 1** is a chronic nerve disorder that occurs most often in the arms or legs after a minor injury.
- **CRPS 2** is caused by an injury to the nerve.

CRPS is thought to result from damage to the nervous system. This includes the nerves that control the blood vessels and sweat glands.

The damaged nerves are no longer able to properly control blood flow, feeling (sensation), and temperature to the affected area. This leads to medical problems in the:

- **Blood vessels**
- **Bones**
- **Muscles**
- **Nerves**
- **Skin**

Possible causes of CRPS:

- Injury directly to a nerve
- Injury or infection in an arm or leg

In rare cases, sudden illnesses such as a heart attack or stroke can cause CRPS. The condition can sometimes appear without obvious injury to the affected limb. This condition is more common in people ages 40 to 60, but younger people can get it, too.

"The skin temperature can undergo dynamic changes in a relatively short period of time (within minutes) depending critically on room temperature, local temperature of the skin and emotional stress. In some cases, the differences in temperatures may fluctuate spontaneously even without any apparent provocation. Thus, the objective finding of differences in temperature and color of the skin can be missed by the physician if only a single physical examination is made". – RSDfoundation.org

In most cases, CRPS has three stages. But, CRPS does not always follow this pattern. Some people develop severe symptoms right away. Others stay in the first stage.

Stage 1 (lasts 1 to 3 months):

- Changes in skin temperature, switching between warm or cold
- Faster growth of nails and hair
- Muscle spasms and joint pain
- Severe burning, aching pain that worsens with the slightest touch or breeze
- Skin that slowly becomes blotchy, purple, pale, or red; thin and shiny; swollen; more sweaty

Stage 2 (lasts 3 to 6 months):

- Continued changes in the skin
- Nails that are cracked and break more easily
- Pain that is becoming worse
- Slower hair growth
- Stiff joints and weak muscles

Stage 3 (irreversible changes can be seen)

- Limited movement in limb because of tightened muscles and tendons (contracture)
- Muscle wasting
- Pain in the entire limb

If pain and other symptoms are severe or long-lasting, many people may experience depression and/or anxiety.

Medical Infrared Imaging

6401 Southwest Freeway Ste. 250

Houston, TX. 77074

TEL: 713-781-9991

A SMART Approach to Early Intervention

Complex Regional Pain Syndrome (CRPS)

Houston Holistic Health Clinic

Medical Thermography Center

CRPS: There is no known prevention at this time. Early treatment is the key to slowing the progression of the disease.

The medical community has demonstrated increased awareness of sympathetic pain syndromes over the last decade. New interventions and approaches toward alleviating symptoms in those afflicted have been tried, some with success. Even better results can be achieved through a greater understanding of which structure is initially responsible for generating the condition.

Direct structural injury, vascular ischemia, infection, and coagulopathy are just a few of the mechanisms that might lead to such an alteration.

Chronic pain and its cause is one of the most difficult diagnostic problems plaguing physicians today.

Frequently patient's tests do not correlate with their symptoms. Individuals with radicular symptomatology may have more than one etiology for their problem. The combined use of anatomic and physiologic testing has long been common in the medical community. However until now the physiologic test of choice has been electromyography (EMG) which studies the motor function of nerve and not its sensory component.

Thermography is a physiologic test that measures the autonomic nervous system. While other physiologic tests exist they do not monitor the pathways in the same fashion as thermography.

"The nociceptive chronic pain is usually due to involvement of large somesthetic (somatic) nerve fibers. Electromyography (EMG) and nerve conduction velocity (NCV) tests are usually the diagnostic tools for the study of somesthetic pain. In contrast, these tests are normal in neuropathic pain because they cannot detect changes in the microscopic thermosensory neurovasculature. The diagnosis and management of neuropathic pain requires neurovascular autonomic tests such as infrared thermal imaging." "ITI exclusively provides diagnostic information in neuropathic pain. Such information cannot be achieved by EMG or NCV." – Dr. Hooshang Hooshmand, M.D.

When performed with proper technique and under controlled conditions, thermography is the test of choice for mapping of vasomotor instability and asymmetry. The findings provide important clinical insights into those structures that generate aberrant sympathetic responses for pain syndromes such as Reflex Sympathetic Dystrophy (RSD) and Complex Regional Pain Syndrome types I and II (CRPS).

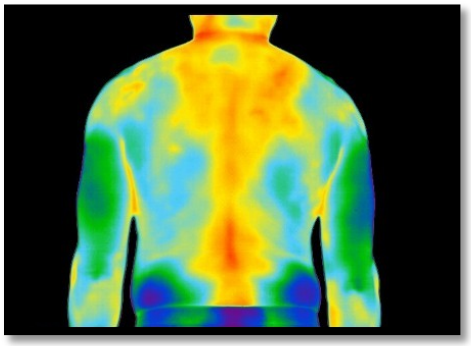
From a thermographic perspective, what is important is whether the resultant vasomotor response is great enough to create a change in skin temperature of greater than 1 ºC compared to the contralateral side or with respect to the surrounding dermatome, sclerotome, or vasotome. While dermatomes represent the distribution of sensory nerve fibers on skin, a sclerotome reflects the distribution of skin galvanic impedance influenced by a visceral or non-visceral soft tissue structure. Numerous sclerotomal patterns exist.

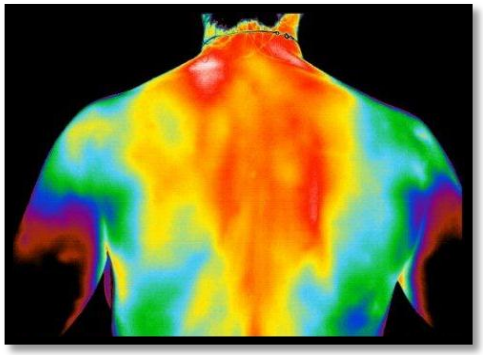
The thermographically generated vasomotor map also provides invaluable information for therapeutic decision-making when treatment previously based upon it fails.

Diagnosing CRPS can be difficult, but early diagnosis is very important. The outlook is better with an early diagnosis. If the doctor diagnoses the condition in the first stage, sometimes signs of the disease may disappear (remission) and normal movement is possible.

By utilizing non-invasive (and therefore not painful) thermal imaging even more information is available to assist us in the treatment of individuals suffering from CRPS. Additionally, thermal imaging can be used to monitor the effectiveness of various interventional pain management techniques by using a safe, highly reproducible, sensitive, and accurate adjunct diagnostic tool. Thermography can detect alterations in the heat patterns.

Localization of trigger points by thermographic means has been shown to increase the effectiveness of injections into these areas.





Stopping progression is one of the most effective treatments a physician has to offer in the treatment of CRPS/RSD. Early diagnosis, due to high sensitivity, is one of the great advantages that thermography offers over triple phase bone scan or diagnostic block in the management of sympathetic pain syndromes.

Doctors are not sure what causes CRPS. In some cases, the sympathetic nervous system plays an important role in the pain. Another theory is that CRPS is caused by a triggering of the immune response, which leads to the inflammatory symptoms of redness, warmth, and swelling in the affected area.