Infrared Thermography Vasomotor Mapping for CRPS/RSD Syndromes

When performed with proper technique and under controlled conditions, medical Infrared Thermography is the test of choice for mapping of heat emission asymmetry patterns. The thermographically generated vasomotor map helps both with diagnosis of the underlying condition and provides invaluable information for therapeutic decision-making. The American Academy of Thermology 2009 Guidelines for Neuro musculoskeletal Thermography (Sympathetic Skin Response Studies) are attached to this abstract and will be reviewed.

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 then 1 degree centigrade compared to the contralateral side or with respect to the surrounding dermatome, sclerotome or vasotome. While dermatomes represent the distribution of sensory nerve fibers upon skin, a sclerotome reflects the distribution of skin galvanic impedance influenced by a visceral or non-visceral soft tissue structure. Numerous sclerotomal patterns exist.

Diffuse vasomotor instability involving an entire limb, or limb segment, not confined to a particular dermatome or sclerotome is the hallmark of true RSD. Dural, neuro-immuno-infectious interactions and multiple generators should be aggressively investigated. Sympathetic variants such as the Angry Back firing C syndrome where backfiring of the C fiber produces a localized increase heat asymmetry pattern (Ca+ dependant K+ channel mediated) and the Triple C Syndrome which produces a localized cold asymmetry pattern (fast K+ voltage gate driven) exist.

A combination of expertise in the basic physiology and anatomy of those structures that can exert influence in the distribution of the vasomotor abnormality found, the ability to objectify where heat emission asymmetry is actually occurring, and an understanding of what kind of variant exists allows for a more rational approach to intervention that is otherwise not possible.