

## Infra-red Thermal Imaging of Sports Injuries

### HIGHLIGHTS AND WHEN TO REFER

#### 1. Reflex Sympathetic Dystrophy

Posttraumatic sympathetic hypertonia can occur after sprain, fracture, or postsurgical. The knee, ankle, and arm are common examples.

FIGURE 1

#### 2. Differentiation of Articular, Myofascial, and Radicular Pain Syndromes

These structures can often cause similar pain patterns. Thermography has a different pattern for these syndromes.

#### 3. Differentiation of Patellofemoral Pain Syndromes and Internal Derangements of the Knee

Patellar problems appear with a cool patella most typically, where as meniscal ligamentous injuries appear hot.

FIGURE 2

#### 4. Myofascial Pain Syndromes

Most typically a focal hot spot on the order of 1-2oC overlying the involved muscles.

FIGURE 3

#### 5. TMJ Syndrome

Most typically a focal hot spot over the involved TMJ with associated myofascial trigger points over the masseter, temporalis, and pterygoids.

#### 6. Shin Splints and Stress Fractures

Both present with anterior calf pain. Stress fractures have a focal hot spot with a "fried egg" appearance with a temperature differential of 2oC. Shin splints have a blush linear increased heat pattern of 0.05 to 1.0oC.

FIGURE 4

#### 7. Stress Studies

When ordering a thermography scan, dynamic stress studies can be very helpful. Stress can be mechanical (raising arms overhead in thoracic outlet cases, sitting, or stooping in low back disc cases,

and then repeating the scan compared to the baseline studies). Or the stress can be a cold stressor test by immersing the hands or feet and recording the autonomic vasomotor response with repeat scan.

## 8. Entrapment Neuropathies

Peripheral nerve entrapments will typically yield an increased thermal emission pattern in the acute stage due to sympathetic ablation. In the chronic stages of the injury a decreased thermal emission pattern will be seen. This can be useful in carpal tunnel syndromes, ulnar nerve entrapments, bickers palsy, and thoracic outlet syndromes.

## 9. Equivocal Anatomical Testing

Thermographic imaging can determine if an MRI/CT documented disc herniation or bulge has clinical significance, since there can often be false positives in MRI. The thermogram will show asymmetry in annular injury.

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