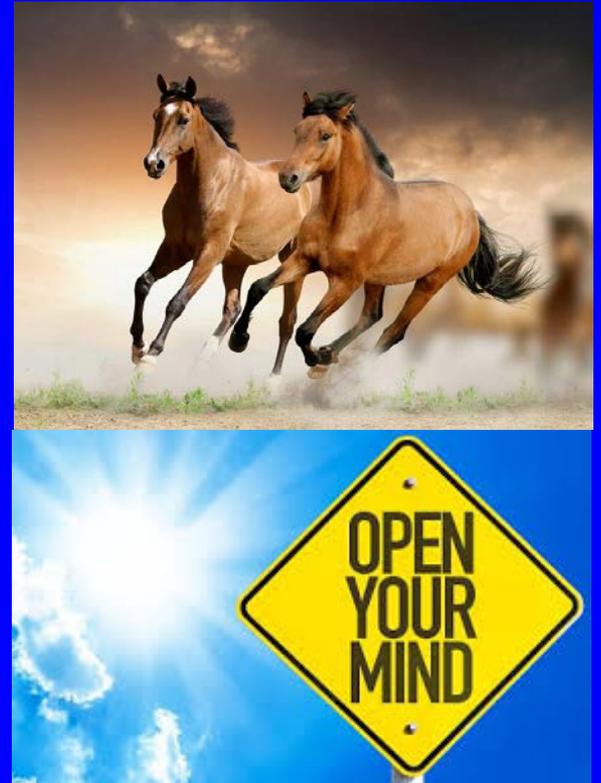


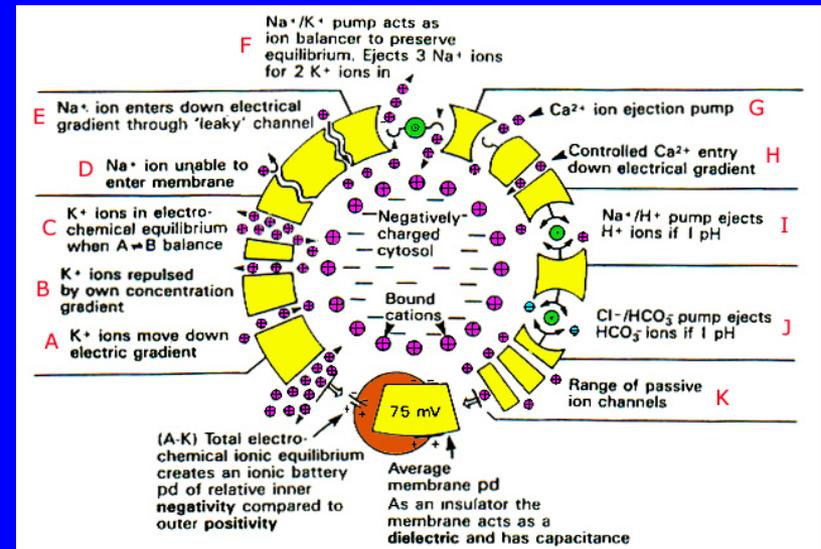
RSD An Alternative Approach To Care

- Treat the source, not just the symptom, & do no harm.
- Change the focus to *restoring* underlying pathology instead of just relieving pain.
- Utilized a shared decision making model (that means everyone has to *work* to get well).



What Is The Cause Of RSD/CRPS?

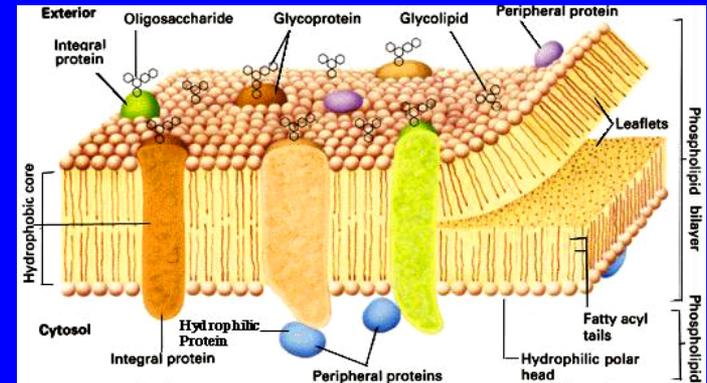
- Medicine typically looks for a unifying diagnosis.*
- All that is required is to focus on restoring nerve membrane stability & blood flow.



*When there is no singular answer the system often breaks down but the good news is that there does not have to be one.

Restore Nerve Membrane Stability

- Treat anything that can affect transmembrane potential.
- Reduce total load.
- Nutritional support, avoid toxins, practice mindfulness.
- Address infection, inflammation, ischemia.



Anything that restores stability can reduce pain.

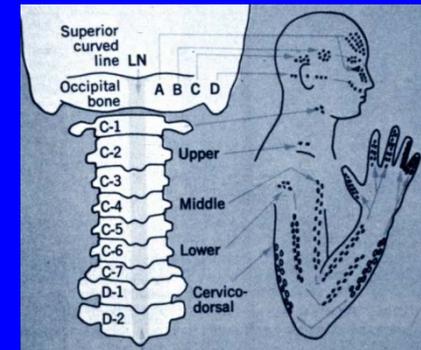
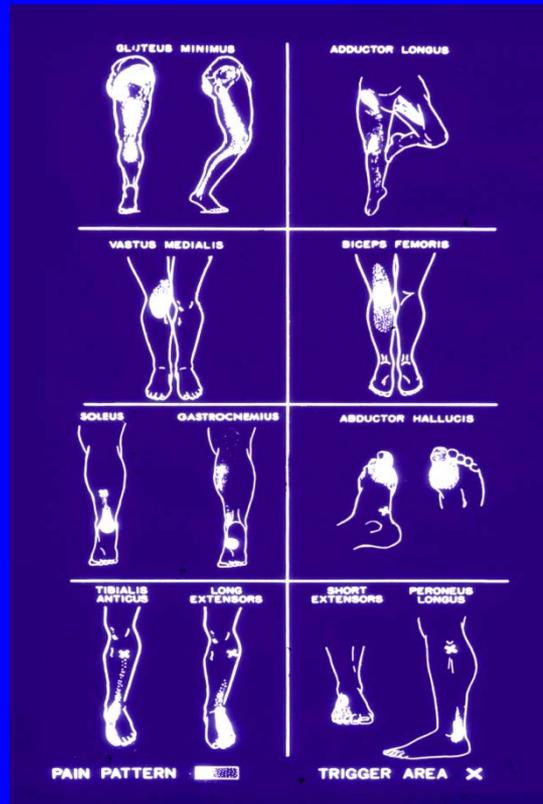
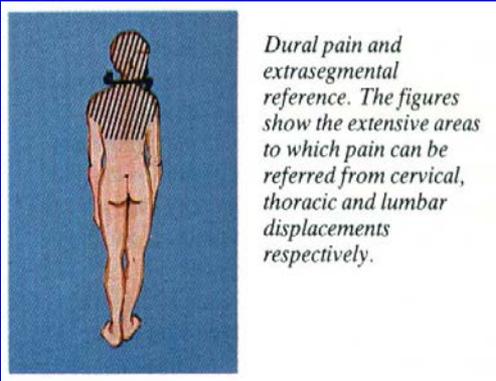
Don't Assume All Cases Are Alike

- Different mechanisms of injury & clinical presentations.
- Different pre-existing conditions.
- Different courses of care & complication.



Why would we treat everyone the same way?

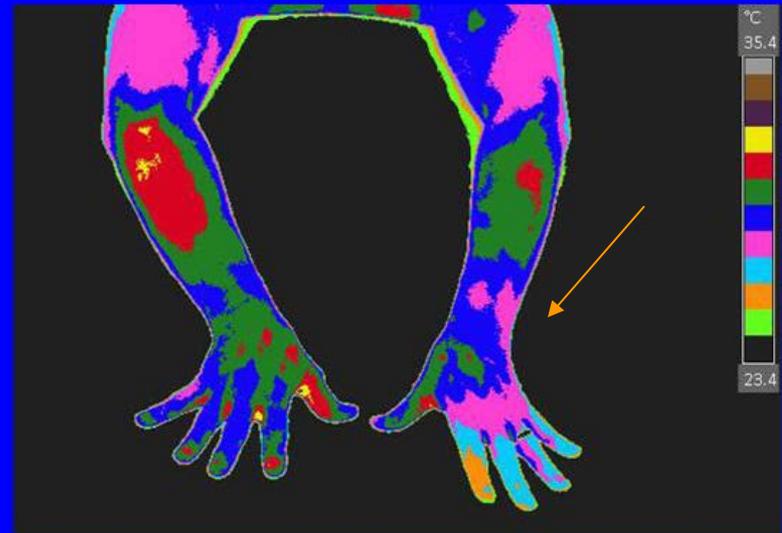
Look For Generators



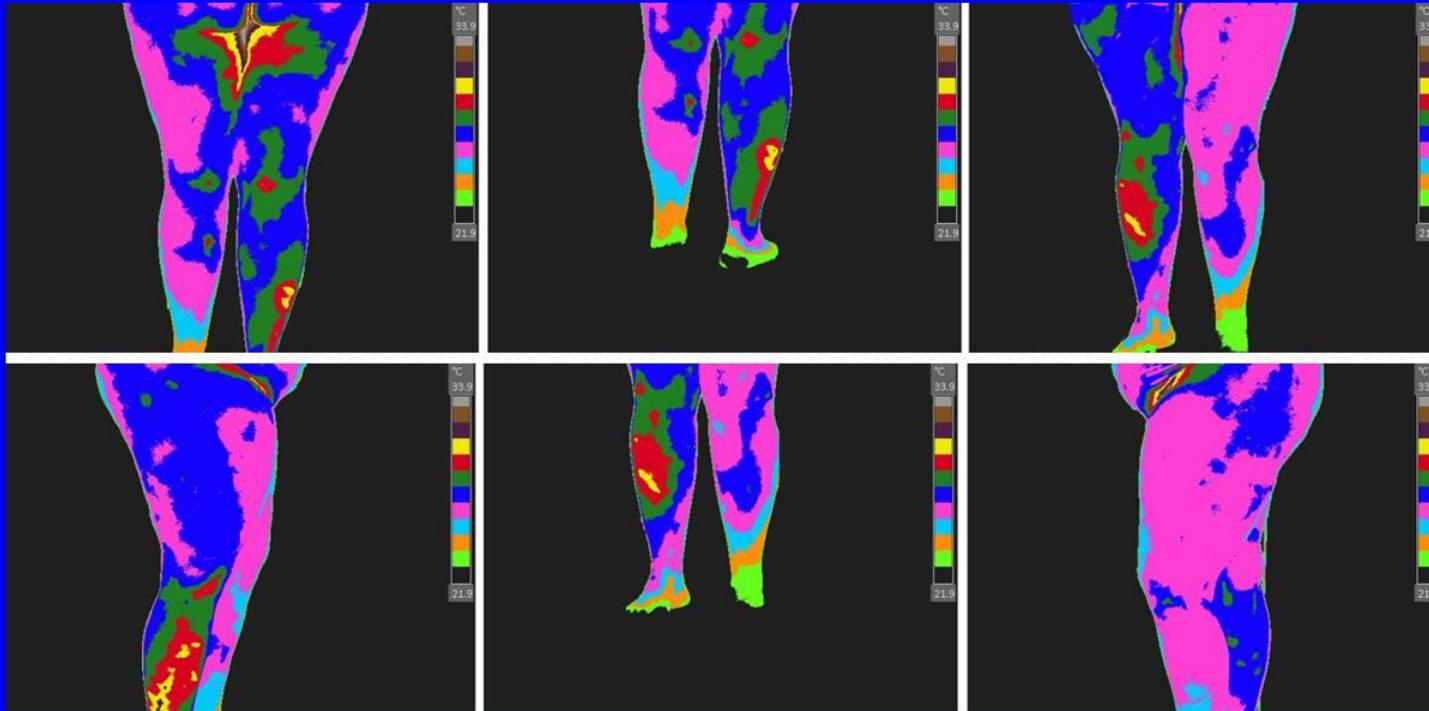
The generator is often not the apparent injured part.

Objectify The Presence & Distribution Of Vasomotor Change

- Full and partial limb, head, neck and torso only iterations exist.
- Cold stress thermology is the only test that can *map* these changes.

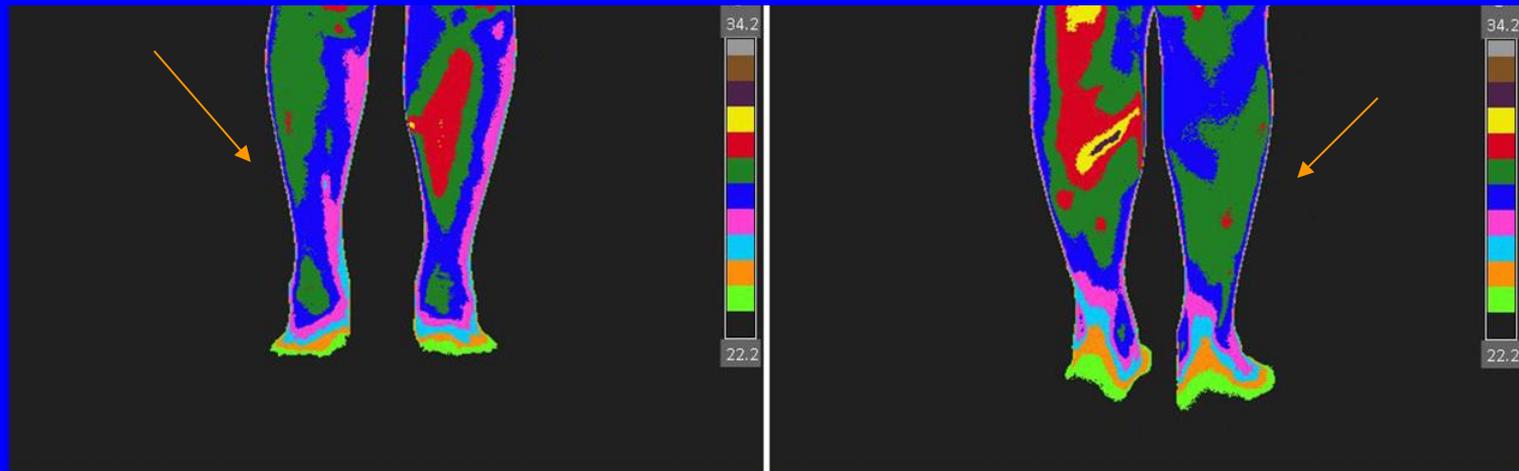


Classic RSD: Entire Limb



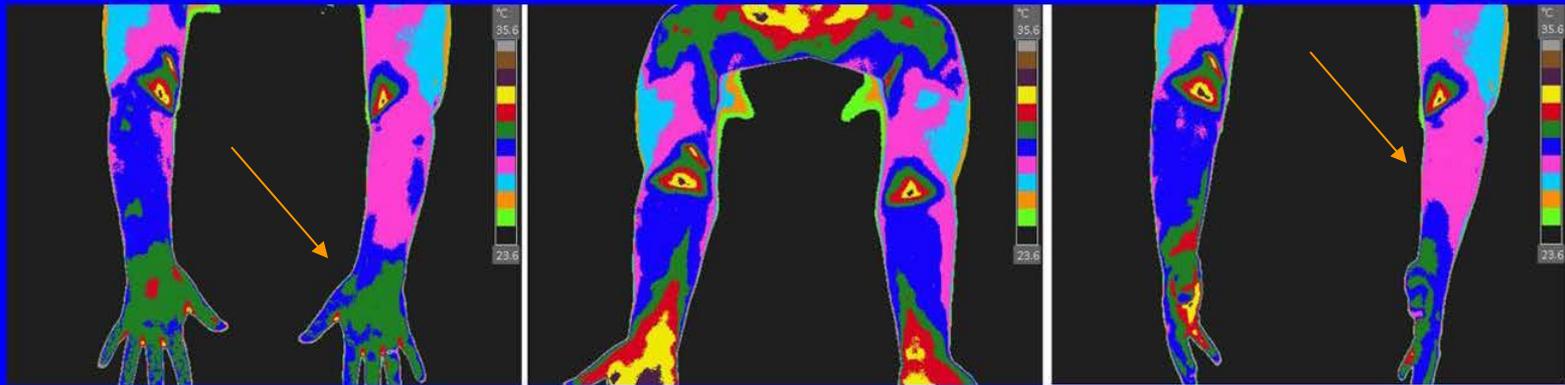
Left lower extremity cold in all views. Treatment for a broken ankle alone will never suffice.

RLE RSD Partial Limb



RSD confined to below the knee. The more distal the findings the less effective proximal treatment is.

Sclerotomal Distribution



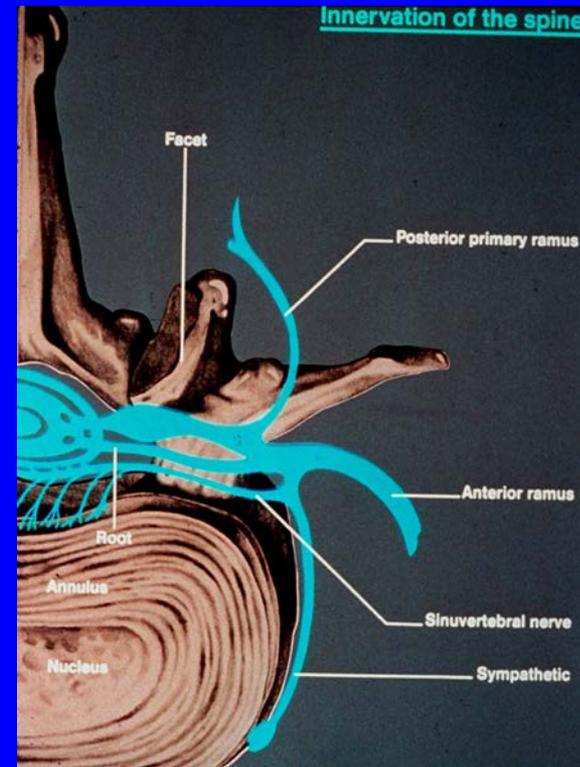
LUE RSD in a C6 distribution.

Cold left dorsal and radial forearm, and 1st & 2nd digit.
Treatment should be directed at structures supplied by C6.

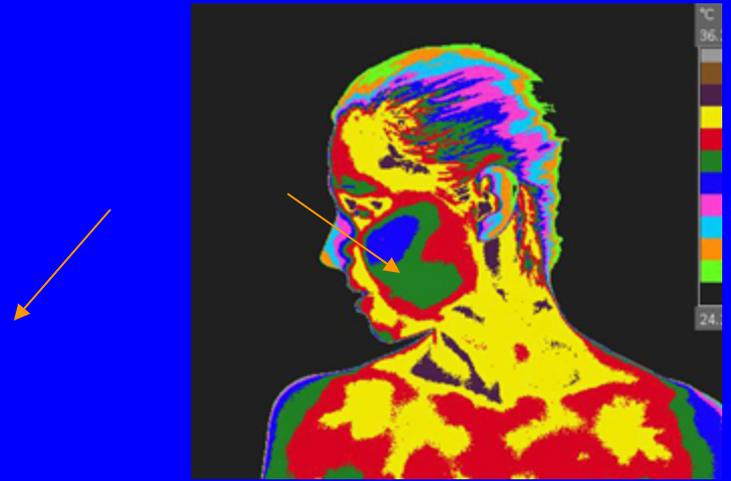
Spinal Induced Sympathetic Pain



Sometimes findings only show up in the posterior compartment.



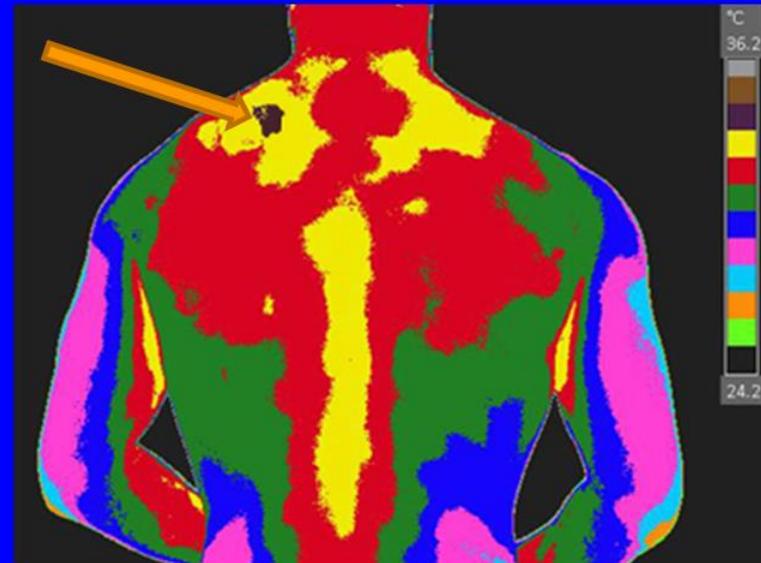
RSD Variants Exist That Are Not Commonly Known



Posterior Cervical Sympathetic Syndrome of Barre-Lieou is due to a traction injury of the posterior cervical sympathetic chain. Other examples include migraine, cluster, and vasomotor headache.

ABC Syndrome

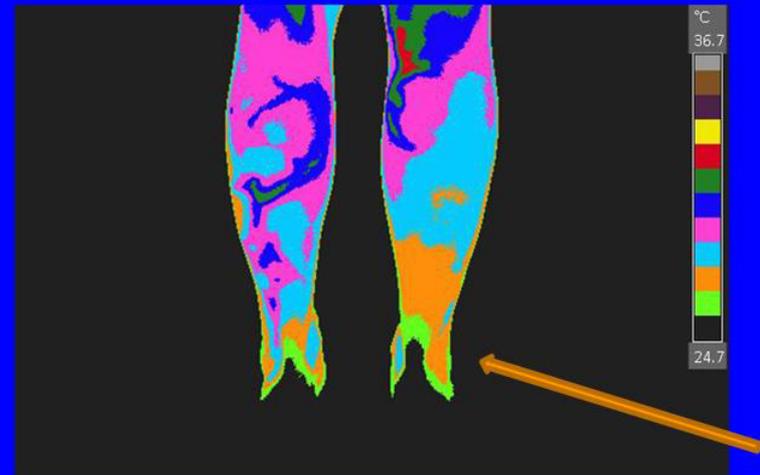
- Warm hyperalgesia
- Cold abolishes pain
- Allodynia
- Axonal reflex
- Backfiring, Ca^{+} dependant K^{+} channel



The Human Sensory Unit & Pain: New Concepts, Syndromes & Tests,
Ochoa, J; Muscle & Nerve, 16:1009-1016; 1993

CCC Syndrome

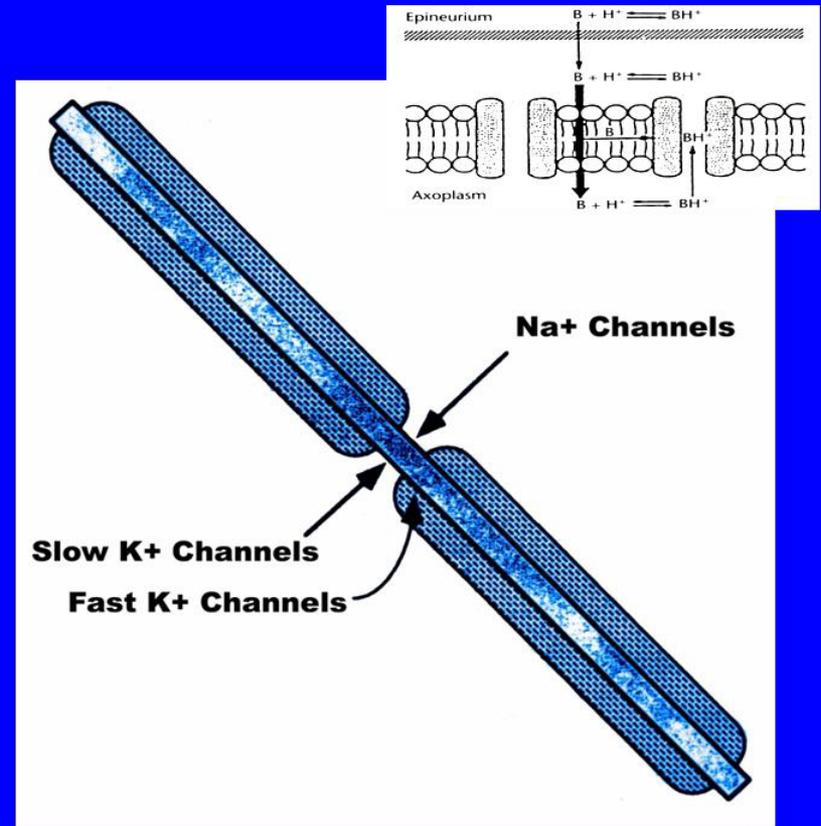
- Cold hyperesthesia
- Cold hyperalgesia
- Cold skin
- Hyperexcitable, fast K⁺ voltage gate



The Human Sensory Unit & Pain: New Concepts, Syndromes & Tests,
Ochoa, J; Muscle & Nerve, 16:1009-1016; 1993

Direct Clinical Impact: Drug Selection

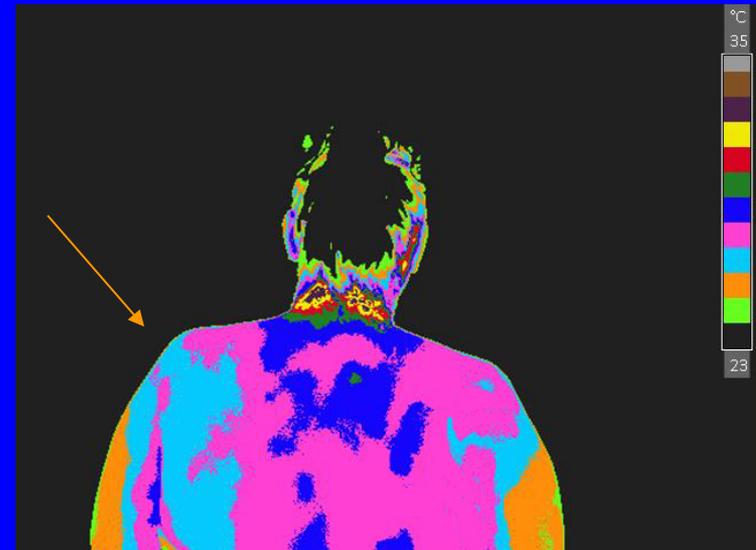
- **Na⁺**: all or none & hyperexcitability
- **Fast K⁺**: intensity of response
- **Slow K⁺**: rate of response
- **Ca⁺ dependant K⁺**: accommodation



Paradoxical responses are not fully explained by cross over or ephaptic transmission

Keep In Mind RSD Look Alikes & Perpetrators

- POTS, Dysautonomia
- Tachycardic events
- Irritable bowel
- Irritable bladder
- Blurred vision
- Fight or flight activity

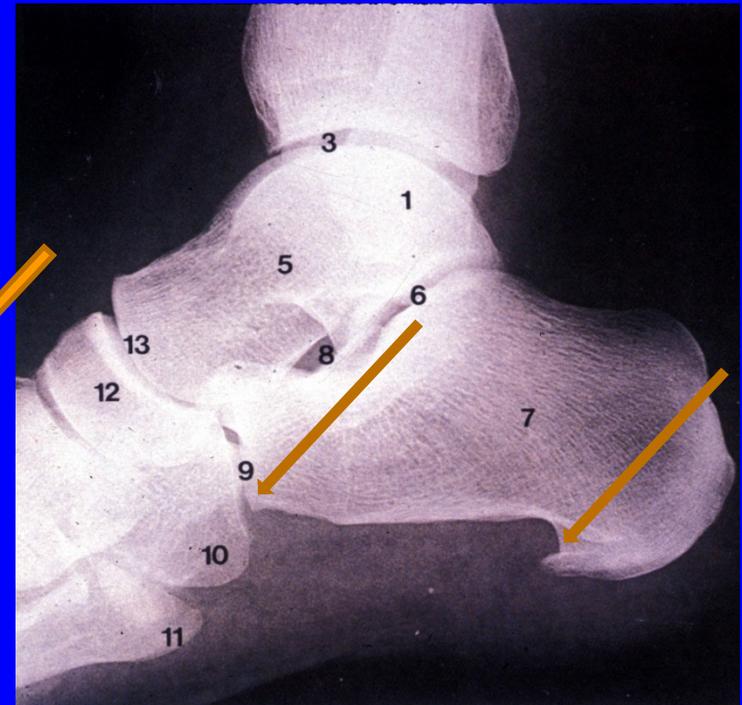


All asymmetries are not necessarily RSD

Generator Identification: Plain Films

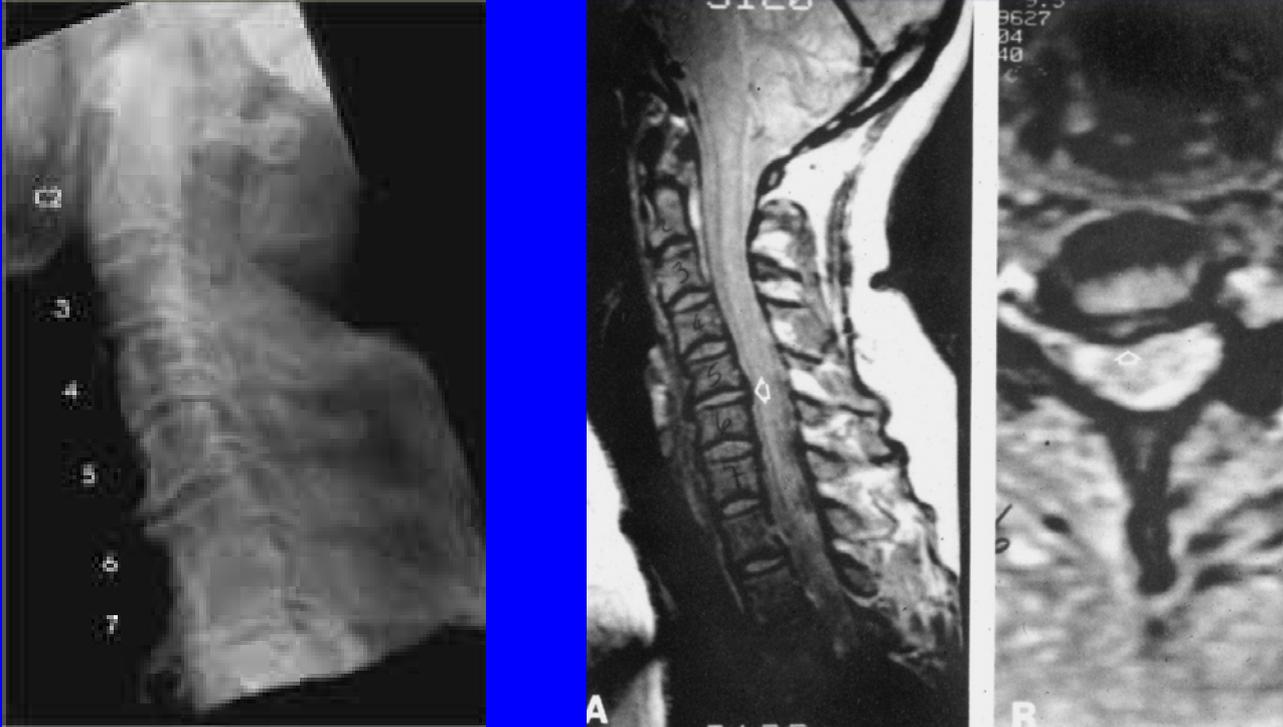


Missed left hip DJD



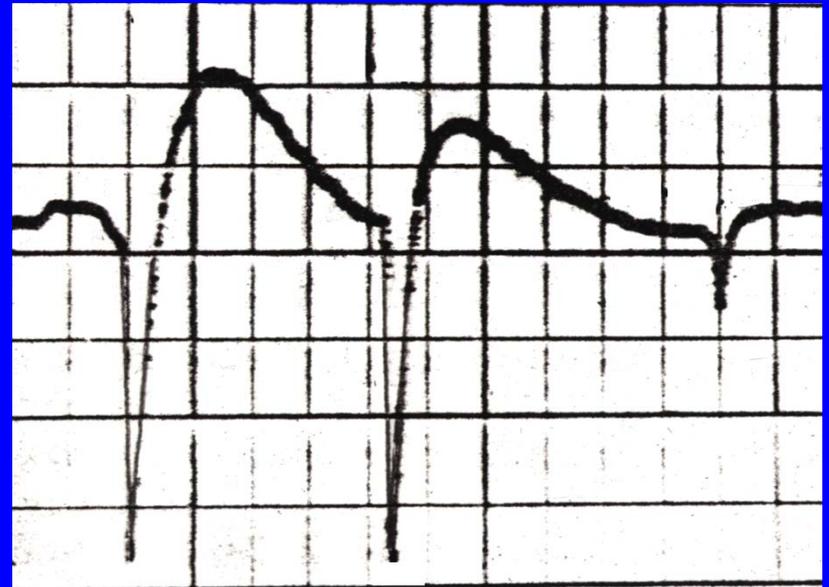
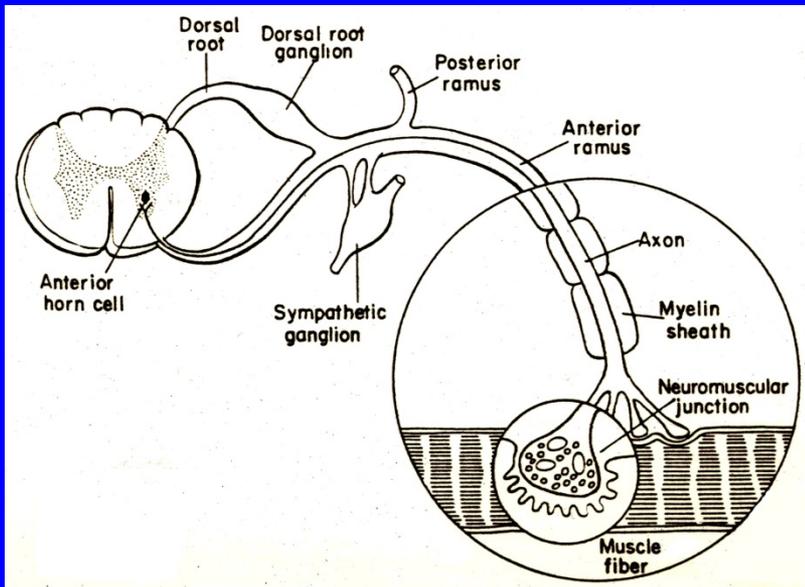
Spurs & joint subluxation

Advance Imaging



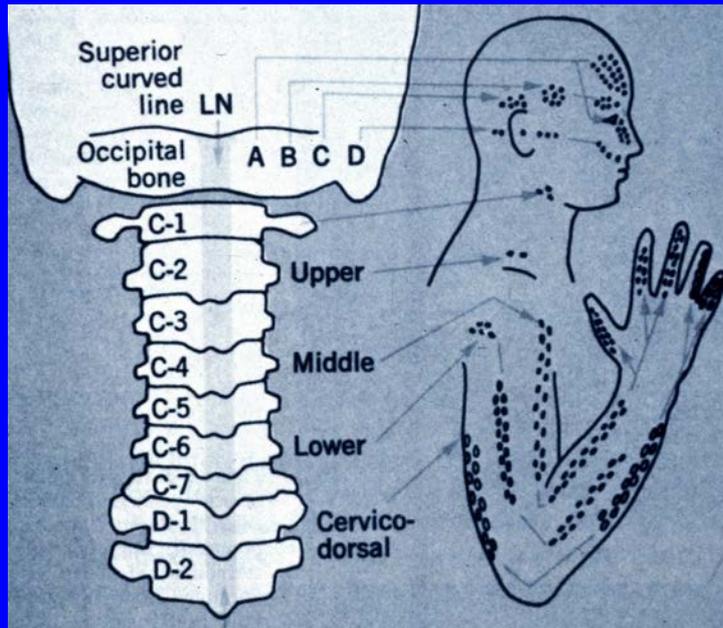
Look for other common conditions that are easier to treat, can reduce pain, & might reverse disease.

Electrodiagnostic Studies



Don't miss associated nerve root irritation, mono-neuropathies or peripheral neuropathy.

Diagnostic Ultrasound



Known sclerotomal maps



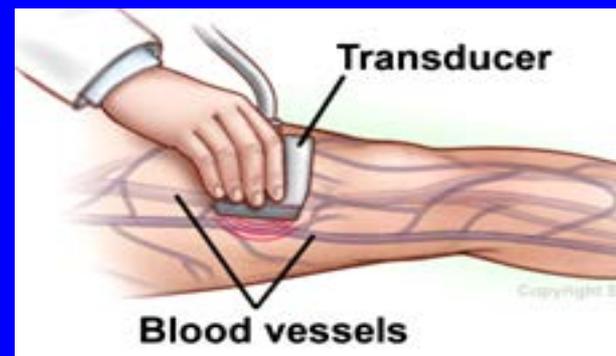
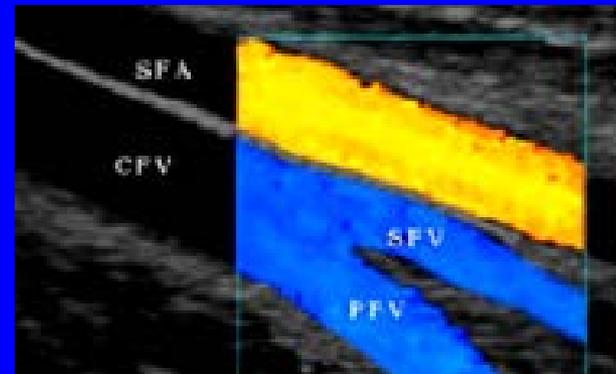
Ligaments are richly supplied by sympathetic nerve fibers.

Other Diagnostic Tests: Laboratory

- Rheumatic
- Vascular
- Hormonal & adrenal
- Infectious-immune
- Heavy metals
- Nutritional status
- Metabolic Medicine

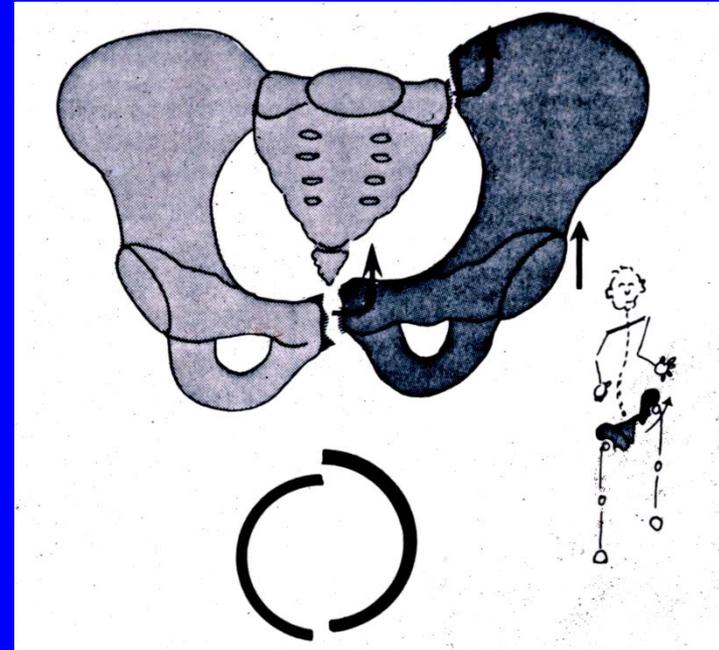


Vascular Doppler & Duplex



Treat comorbid PAD and Venous Disorders

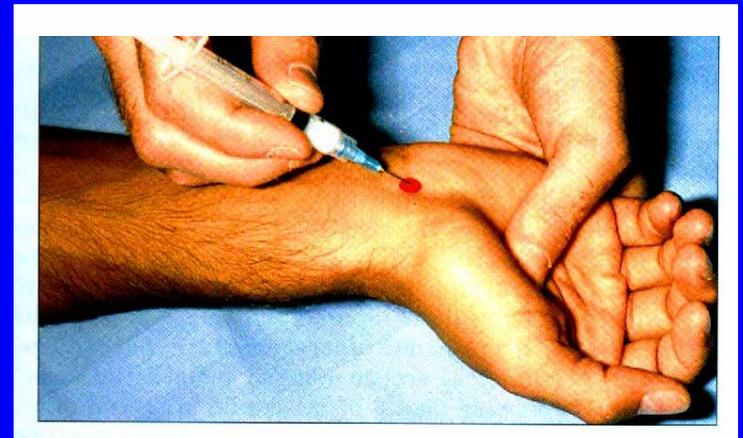
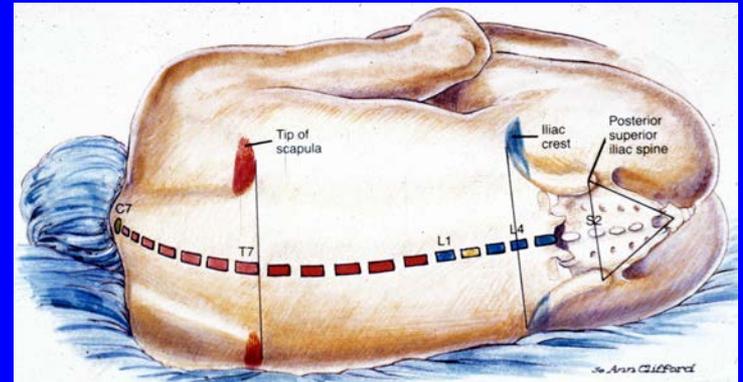
Gait & Posture Analysis



There are multiple strategies to improve posture, body mechanics, & abnormality of gait that reduce pain.

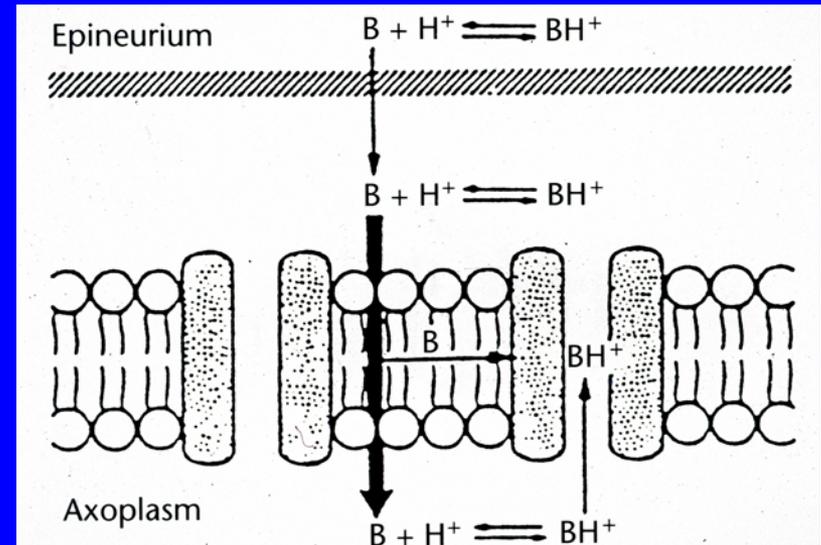
Treatment Options: Steroid Injections

- Dexamethasone with Xylocaine or saline for spinal injections.
- Xylocaine with dexamethasone for peripheral nerve blocks.
- Goals include:
 - pain relief
 - inflammation reduction



Anesthetic Injections

- Nerve Blocks
- Facet & Spinal Blocks
- Tendon & Muscle
- Goals include:
 - Pain reduction
 - Tissue restoration
 - Block above & treat below



Hyperpolarization can lead to nerve membrane restoration

Ultrasound Guidance



90% of the time procedures can be done in the office. Using US instead of fluoroscopy for guidance greatly reduces cost.

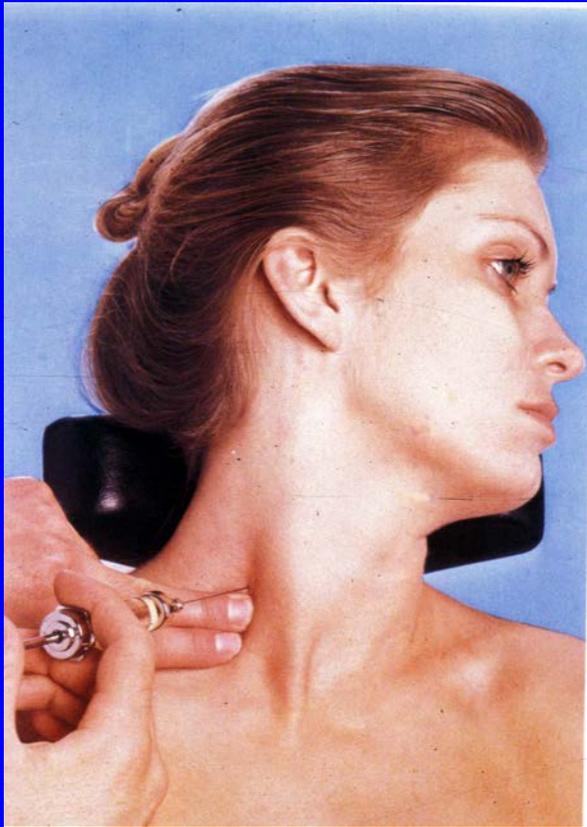
Electric Stellate Block

- Objectively proven on SSR (Thermography).
- Allows voltage gated approach to treatment.
- Efficacy increases with successive use.
- Electro-poration.

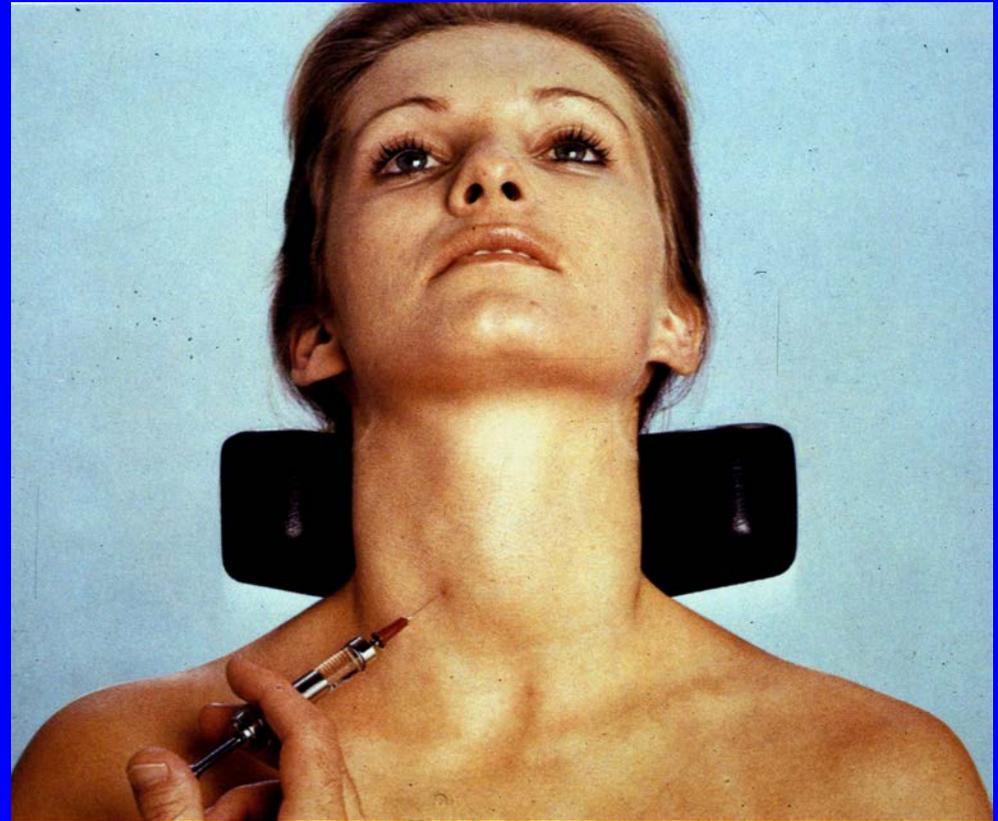


Electric Sympathetic Block: Current Theoretical Concepts & Clinical Results;
Schwartz, R; J Of Back & Musculoskeletal Rehabilitation; 1998; 10:31-46.

Cervical Plexus & Stellate Block



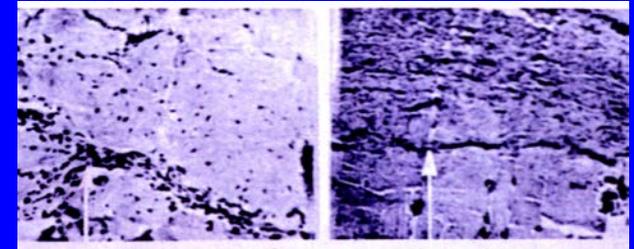
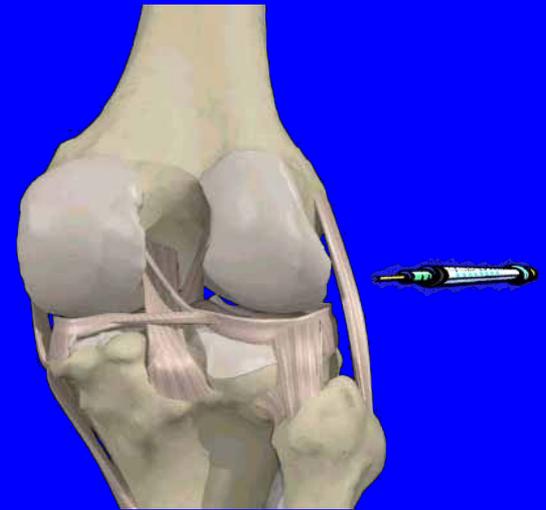
Cervical Plexus



Stellate Ganglion Block

Prollotherapy

- One injection, done 3X, 2-3 weeks apart.
- Natural compounds.
- After the third injection the treated ligament is 40% thicker (biopsy proven).
- Works by “pulling” growth factors to the area to heal much like a scab on skin.

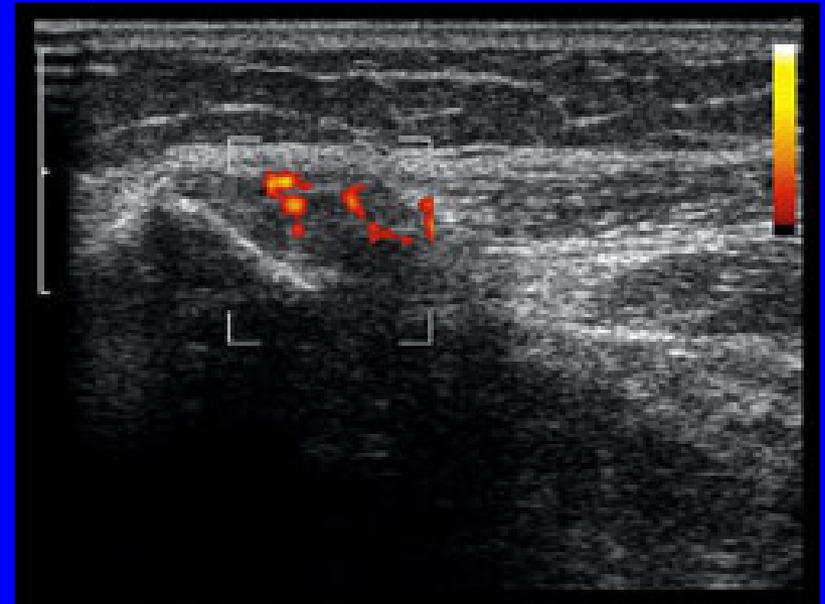


Pre

Post

Percutaneous Tenotomy/Fasciotomy

- 80% report at least 90% or more relief.
- Most are improved at 2 week follow up.
- Full recovery takes up to three months.
- Utility is limited to muscle & tendon.



Results can be monitored with
Power Doppler & MSK US

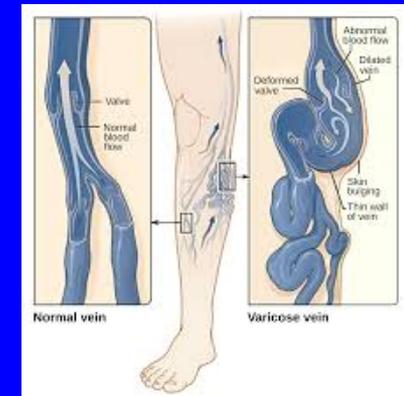
Immuno-Inflammatory Approach

- Antibiotic Protocol
- Marshall Protocol
 - A.P. plus an ARB
- TH2 cytokine immune inducing tactics.
- Anti-fungal, mold and allergen interventions.

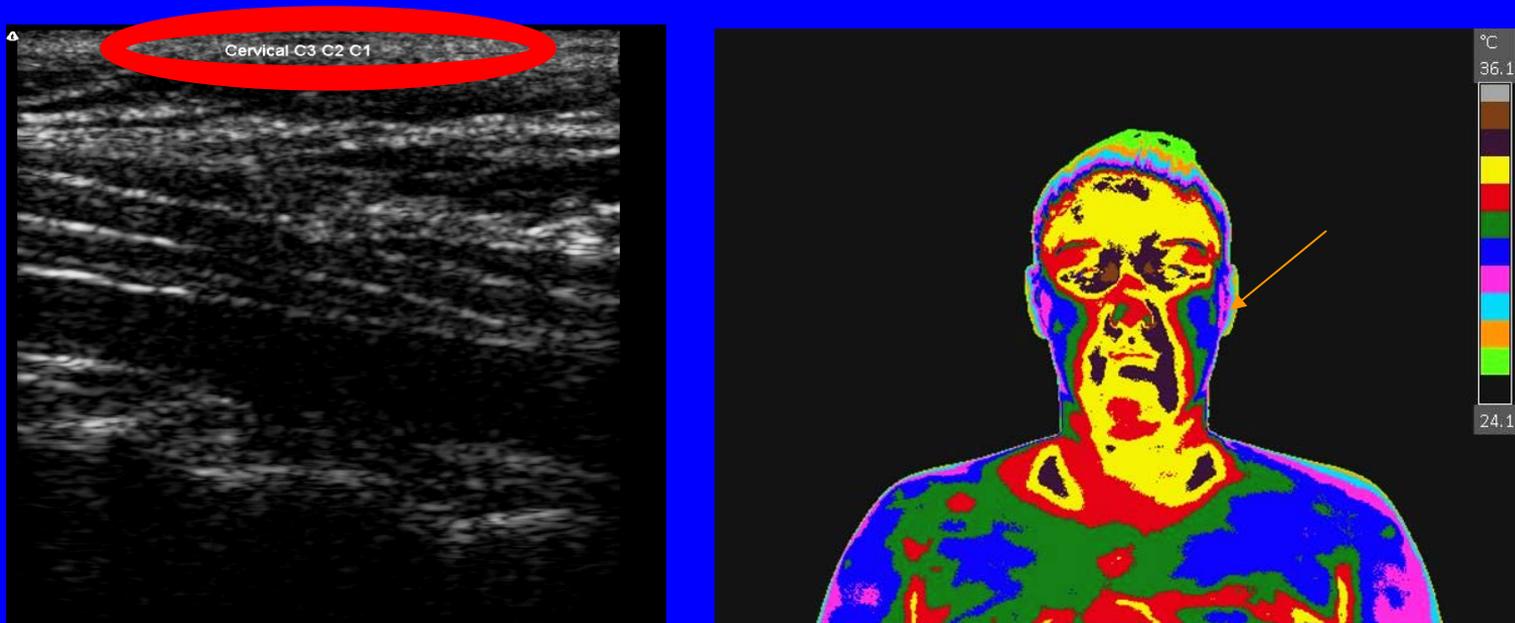


Vasodilators & Vascular Medicine

- Compression stockings
- Juice plus, mg citrate, omega three's, & others
- Bolouke
- Lovenox
- Catapress
- Plavix

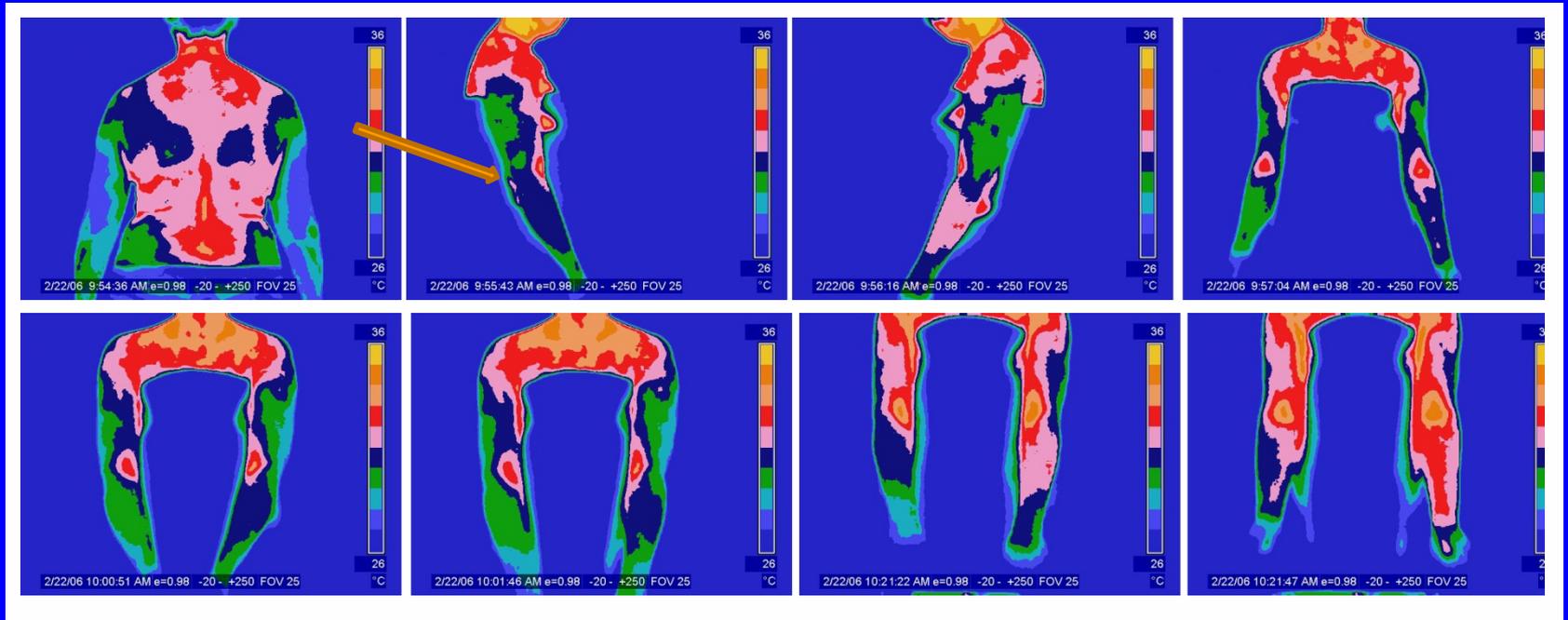


Putting It Together



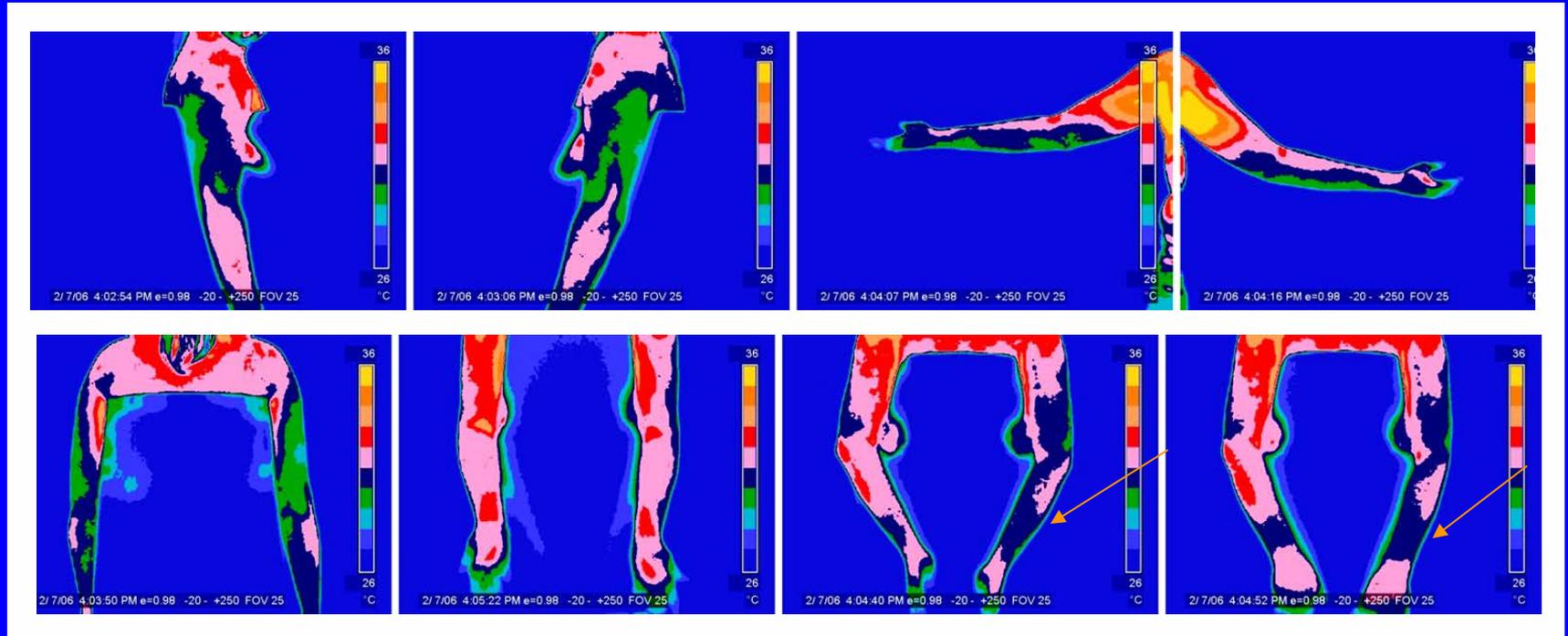
Identify & treat the source, not just the symptom. Barre-Lieou responsive to SPG/SCSG block & C23 paravertebral & interspinous injection.

Block Above & Treat Below



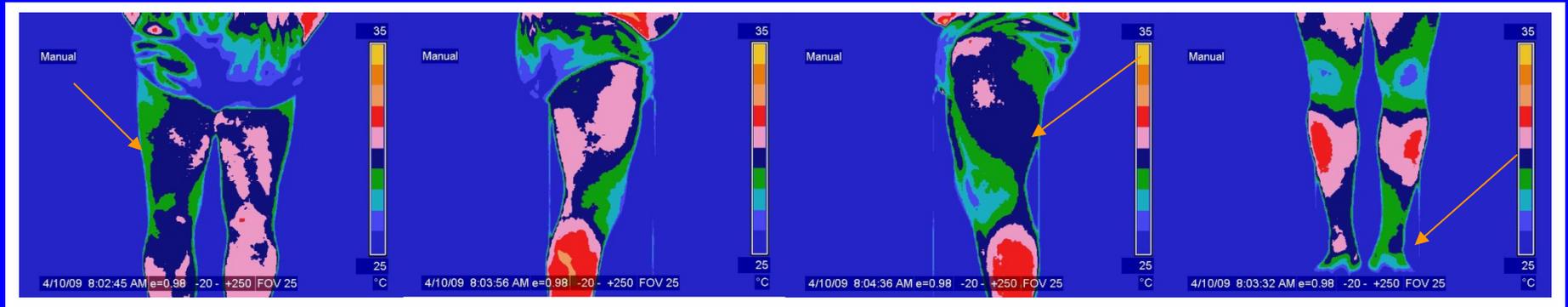
Right elbow pain assoc. with a history of 2nd & 3rd finger vasospasm. Stellate block followed by US guided percutaneous tenotomy brought lasting relief.

Block Above May Treat The Source



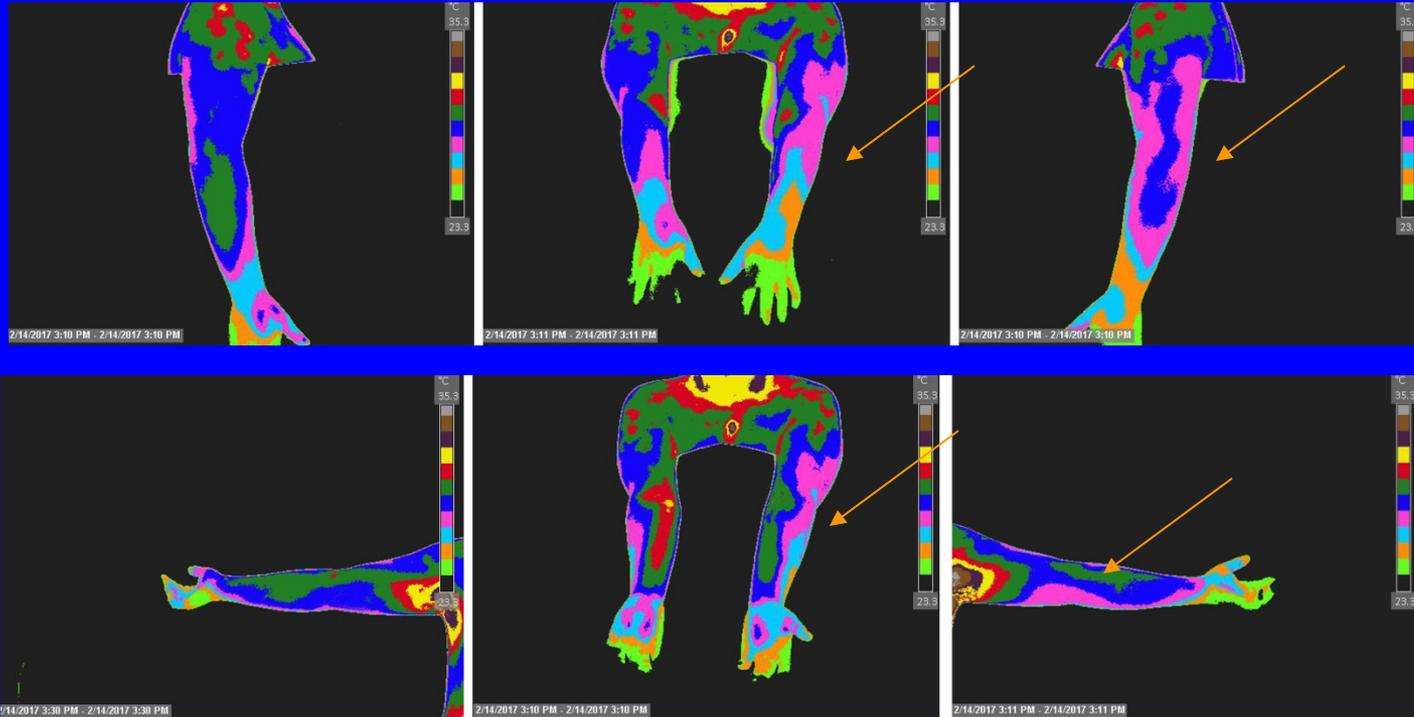
Left shoulder adhesive capsulitis. Shoulder ROM improved with left C56 PVNB.

Block Above & Treat Comorbid Disease



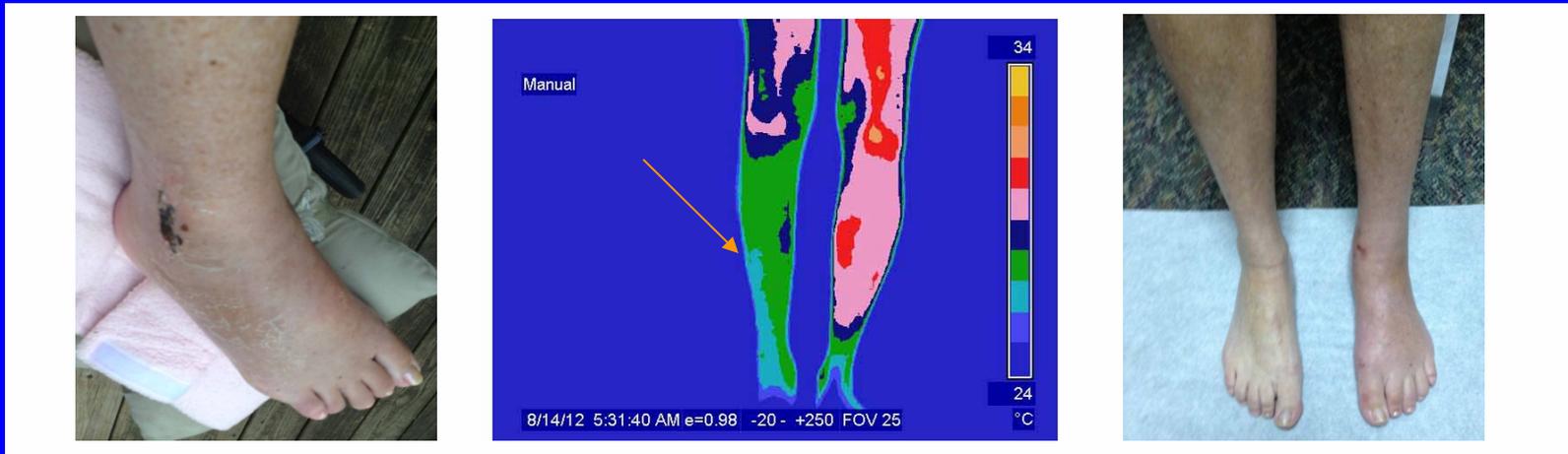
S/P left Morton's neuroma resection x 2. PMH + for NIDDM, HTN & venous reflux. Sympathetic block at L45 followed by treatment of comorbid conditions finally provided lasting relief.

RSD Reversed With PRP



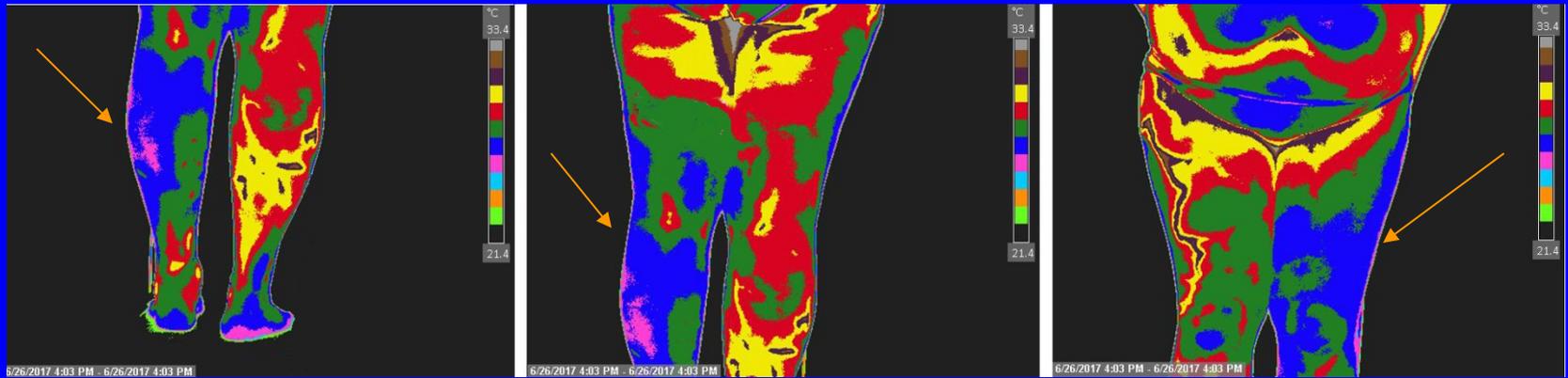
15 YO male dx with RSD at Cincinnati Children's. DX US showed ECRL & FCU Tendinosis. Due to the diagnosis, travel, time, and cost constraints tenotomy was not done; PRP grafting was administered to both tendons. Excellent outcome was obtained.

RSD Reversed With Stem Cell



LLE RSD after trimalleolar fracture. Segmental vascular study with ABI of 1.32 on left and 1.00 on right. Left calf-to-toe pressures with a 30mm Hg segmental increase. BMA stem cell grafting to the calf & ankle was chosen to address both problems.

Successful UCD Stem Cell Allograft



32YO female s/p left ankle ORIF with pin removal after an inversion injury (plate still in place). DX US showed fib talo and medial deltoid ligament strain. Sympathetic block, ESI, & local prolo injections did not help. 30M UCD stem cells were grafted at the ankle ligaments, into the calf and at L45. PRP followed 2 weeks later. Over the next 6 months 85% symptom reduction obtained & patient is off all meds.

So This Is Our Paradigm

- Reduce total load.
- Think restoration.
- Treatment should not contribute to disease.
- Manage expectations.
- Explain dysautonomia.
- Find meaning in adversity.



Somato-Emotional Impacts & Acceptance

Challenge & Choice

Brain Highways

Systema Health

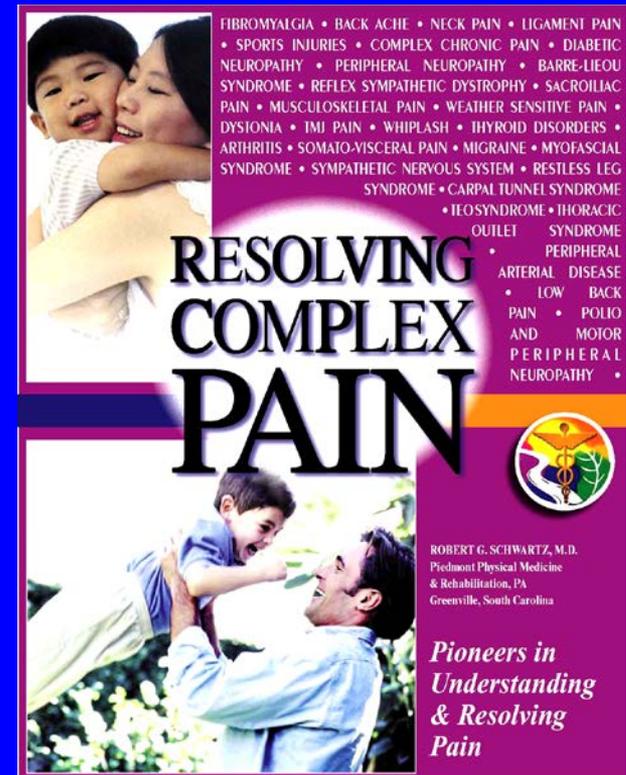
SC RSD Support Group

I Have RSD But It Does Not
Have Me



Summary: There Are Choices

- Objectively measure the presence of disease.
- Think about the underlying generator of the pain.
- Determine an individualized course of care.
- Reduce total load and focus on restoring pathology.



RSD



Robert G. Schwartz, M.D.
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A collage of website content for the American Academy of Thermology. It includes several text blocks and a thermal image. At the top left, the text reads "AMERICAN ACADEMY OF THERMOLOGY" in red, followed by "American Academy of Thermology The premiere organization in North America for the scientific development, healthcare training, and clinical application of medical infrared imaging." Below this is a link "EXPLORE OUR NETWORK OF CERTIFIED THERMOLOGISTS". To the right, there is a blue box with the same organization description and a red "Join Now!" button. In the center, there is a red box with the word "GUIDELINES" in white. Below that, the text reads "Neuro-Musculoskeletal THERMOGRAPHY" and "This guideline was prepared by members of the American Academy Of Thermology (AAT) as a guide to aid the performance of medical infrared imaging in evaluating patients with neuromusculoskeletal complaints." At the bottom left of this section is a "LEARN MORE" link. On the right side of the collage is a thermal image of a human neck and upper chest area, showing a color gradient from blue (cooler) to red (warmer).