

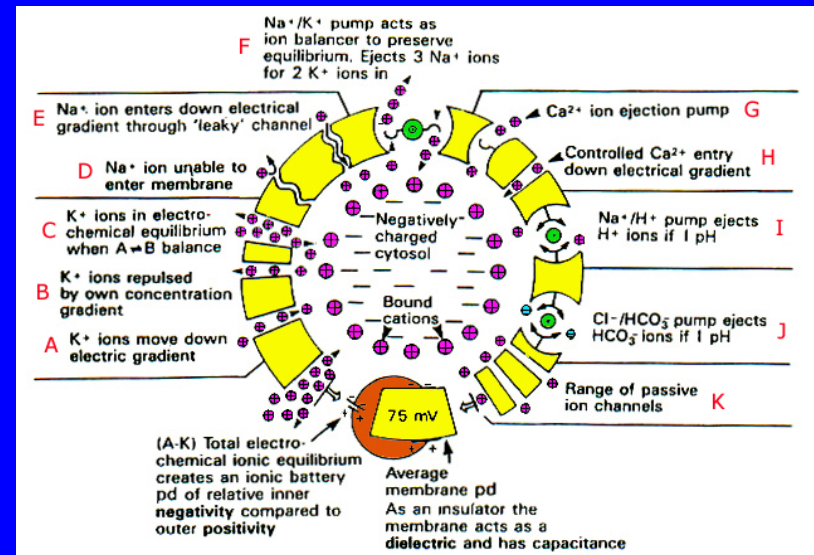
# RSD An Alternative Approach To Care

- 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?

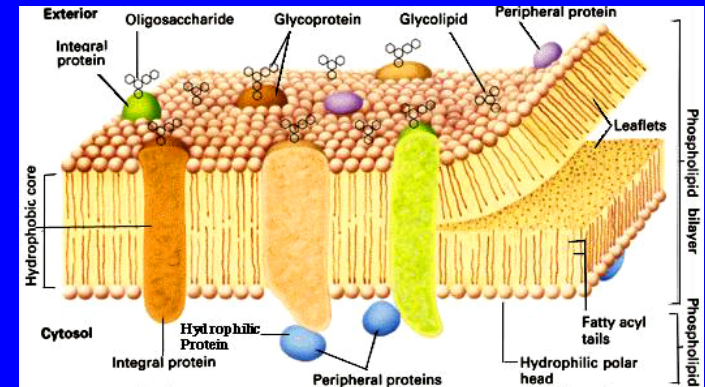
- Medicine typically looks for a unifying diagnosis.\*
- All that is required is to focus on restoring nerve membrane stability & blood flow.



\*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

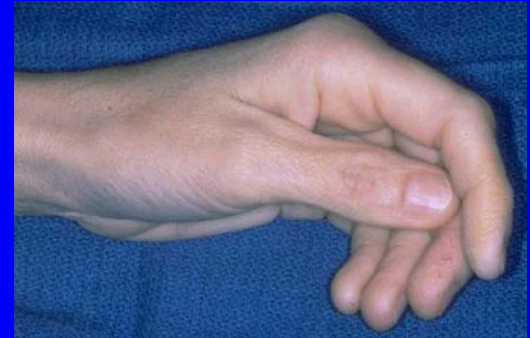
- Treat anything that can affect transmembrane potential.
- Reduce total load.
- Nutritional support, avoid toxins, practice mindfulness.
- Address infection, inflammation, ischemia.



Anything that restores stability can reduce pain.

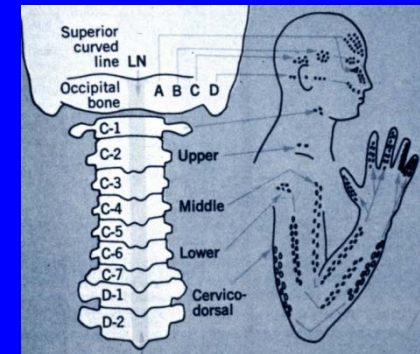
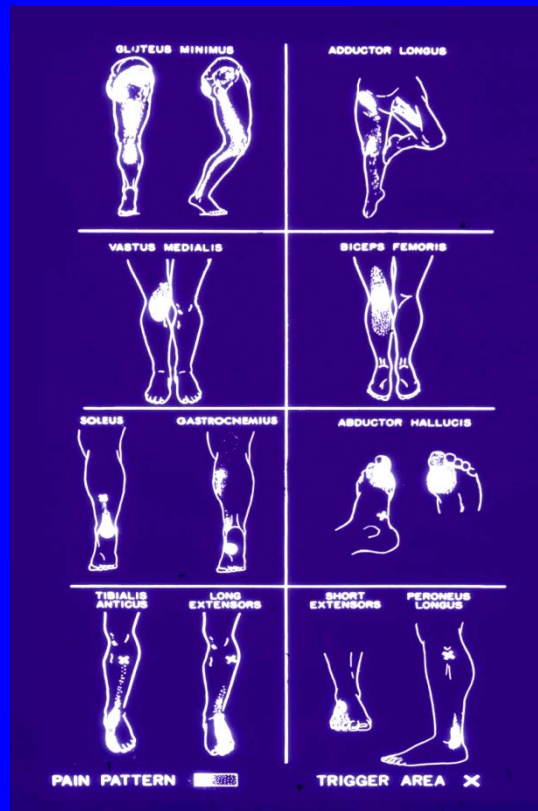
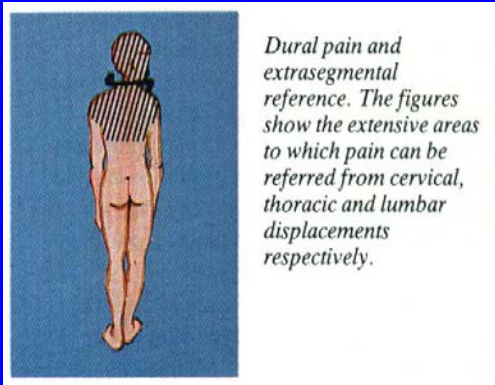
# Don't Assume All Cases Are Alike

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



Why would we treat everyone the same way?

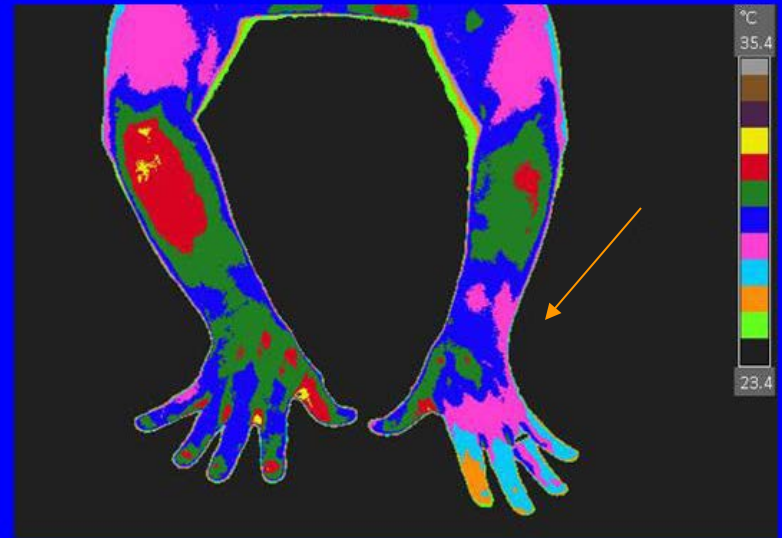
# Look For Generators



The generator is often not the apparent injured part.

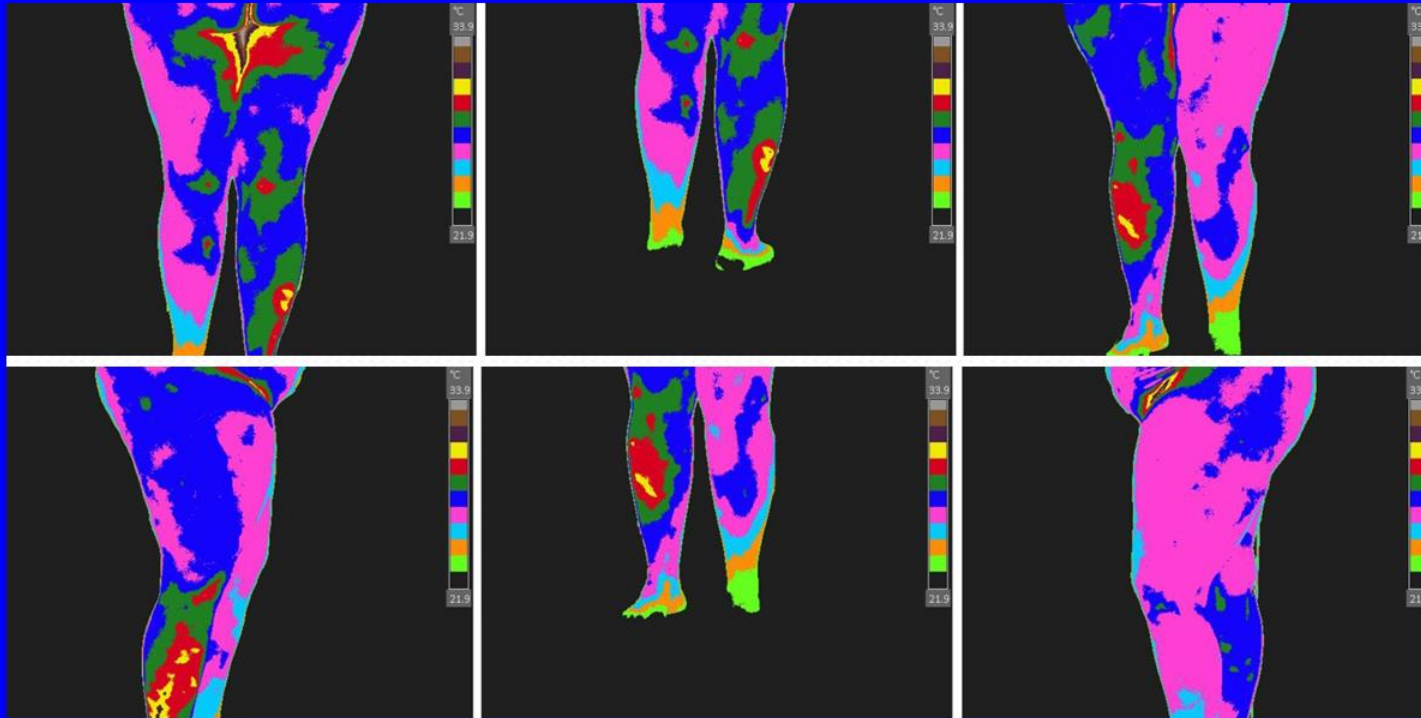
# Objectify The Presence & Distribution Of Vasomotor Change

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



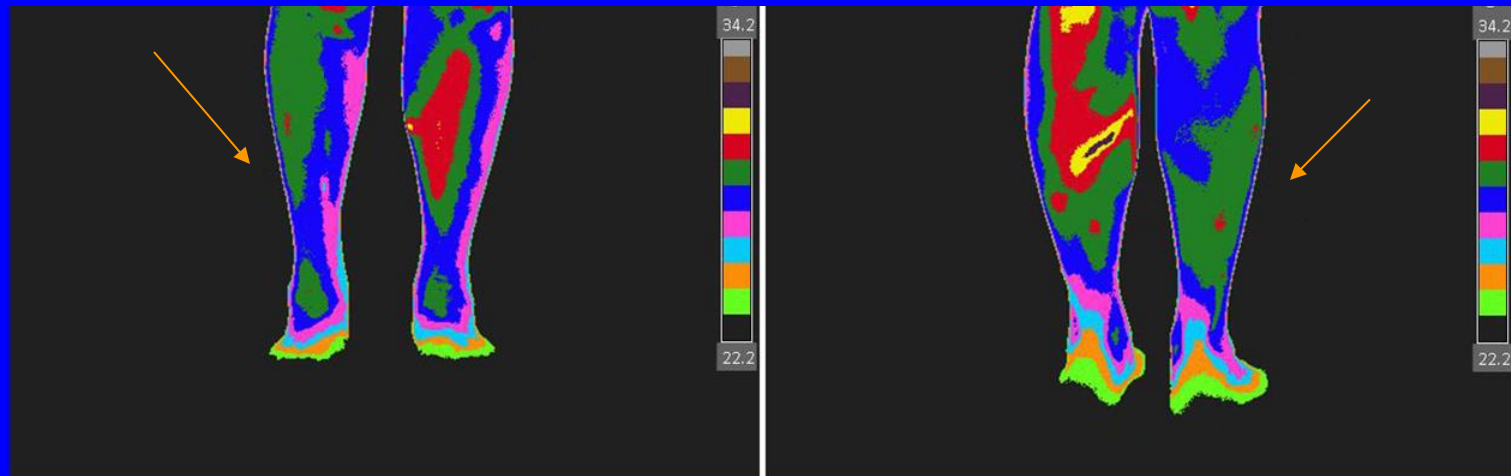


# Classic RSD: Entire Limb



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

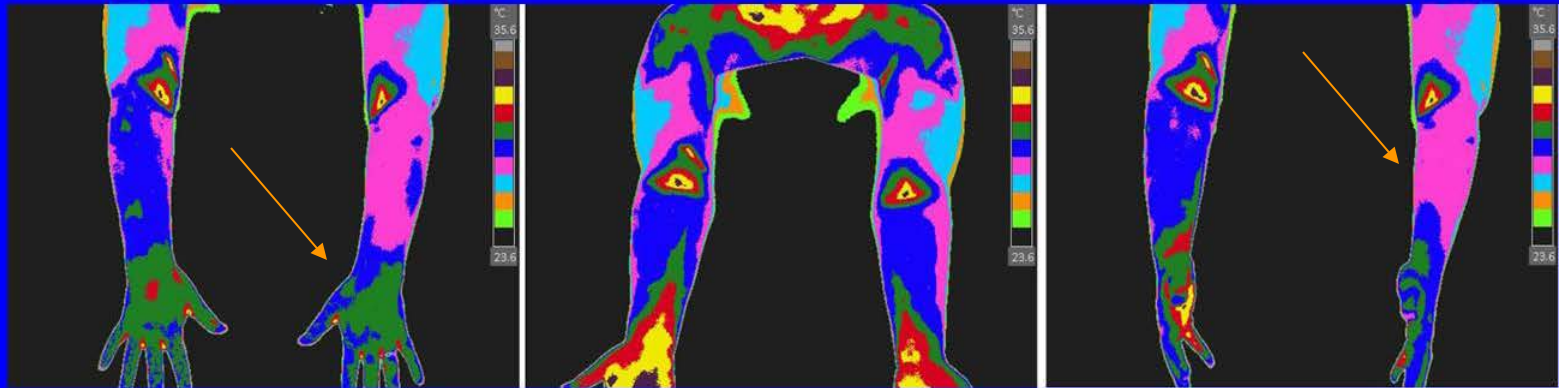
# RLE RSD Partial Limb



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



# Sclerotomal Distribution



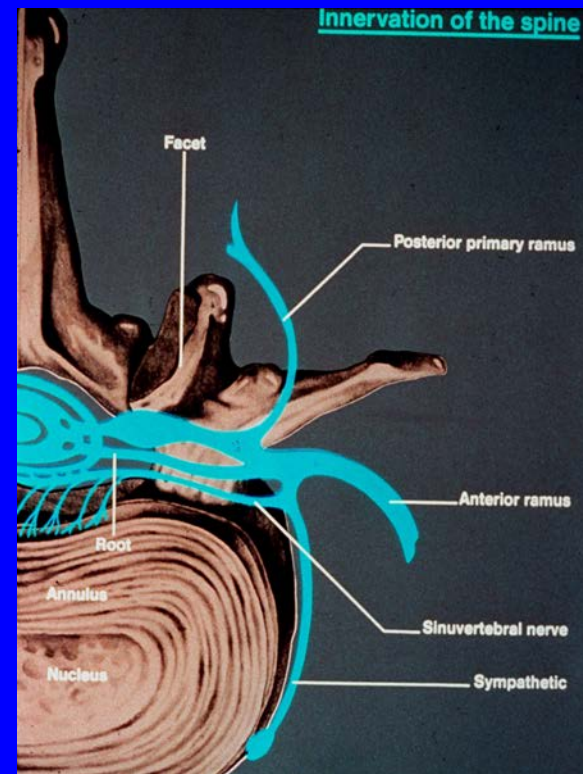
LUE RSD in a C6 distribution.

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

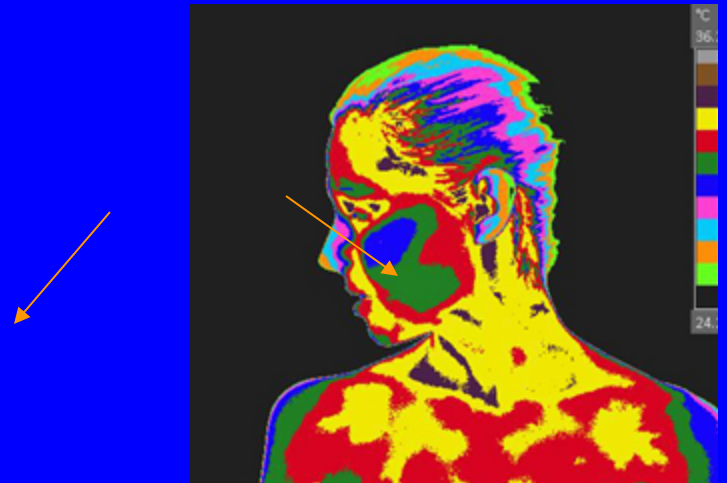
# Spinal Induced Sympathetic Pain



Sometimes findings only show up in the posterior compartment.



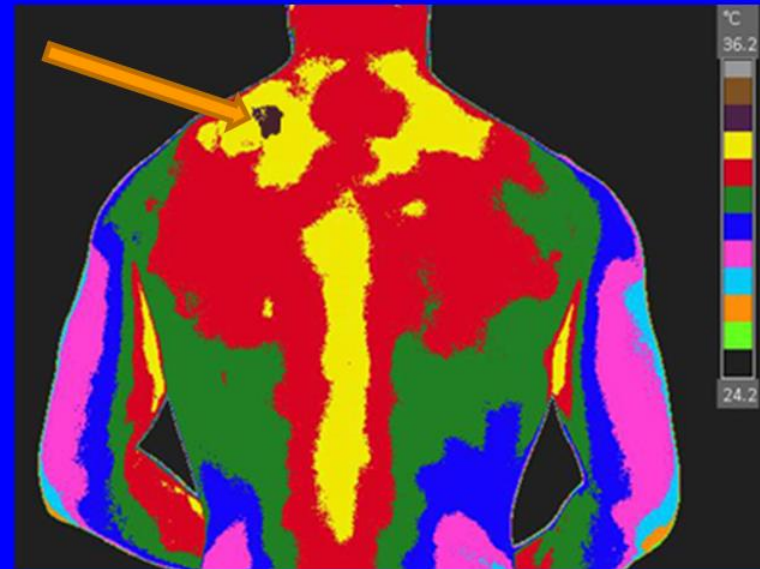
# RSD Variants Exist That Are Not Commonly Known



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

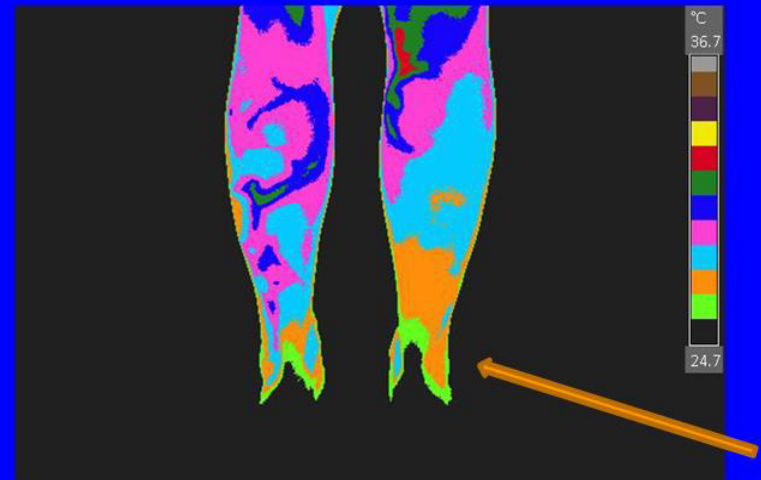
- Warm hyperalgesia
- Cold abolishes pain
- Allodynia
- Axonal reflex
- Backfiring,  $\text{Ca}^{+}$  dependant  $\text{K}^{+}$  channel



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<sup>+</sup> voltage gate

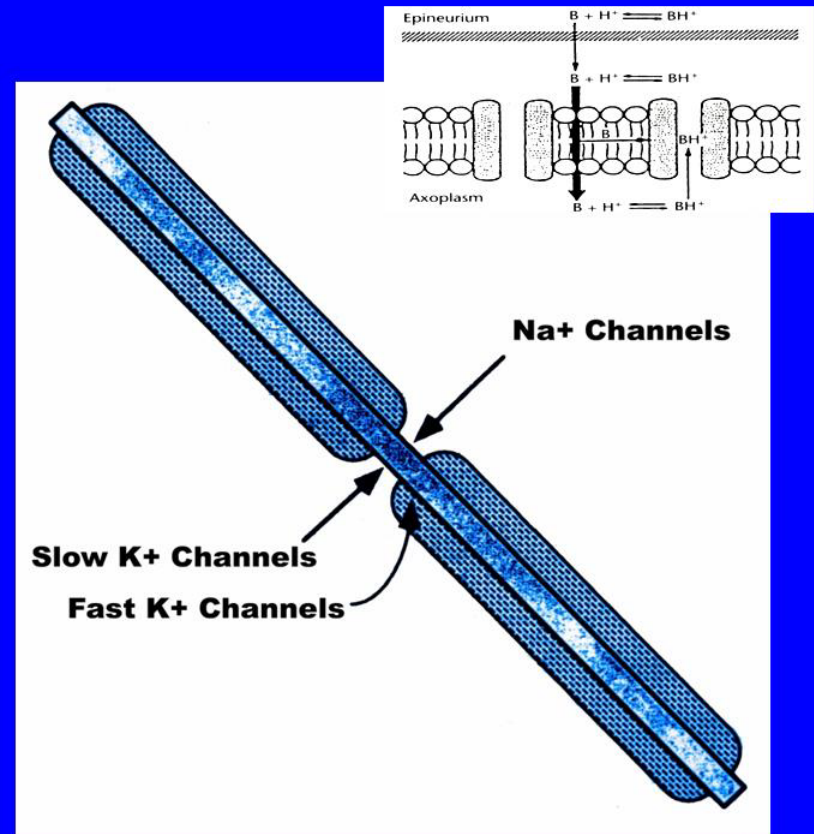


The Human Sensory Unit & Pain: New Concepts, Syndromes & Tests,  
Ochoa, J; Muscle & Nerve, 16:1009-1016; 1993



# Direct Clinical Impact: Drug Selection

- $\text{Na}^+$ : all or none & hyperexcitability
- Fast  $\text{K}^+$ : intensity of response
- Slow  $\text{K}^+$ : rate of response
- $\text{Ca}^{2+}$  dependant  $\text{K}^+$ : accommodation

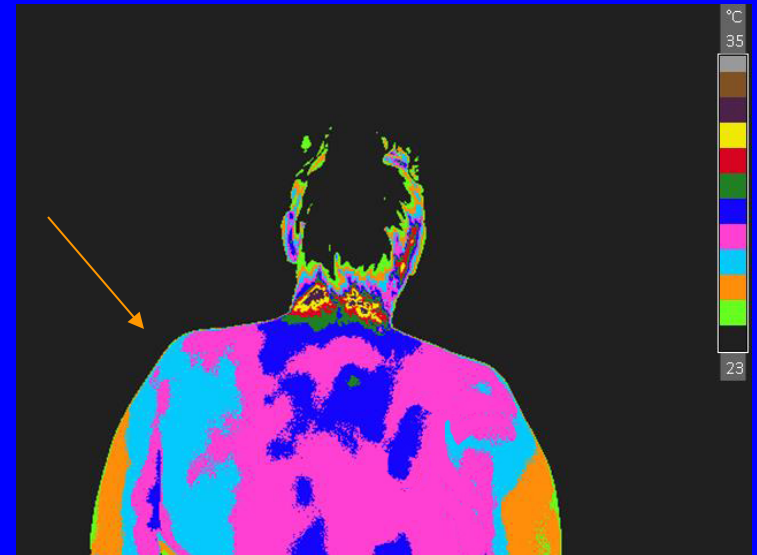


Paradoxical responses are not fully explained by cross over or ephaptic transmission



# Keep In Mind RSD Look Alikes & Perpetrators

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

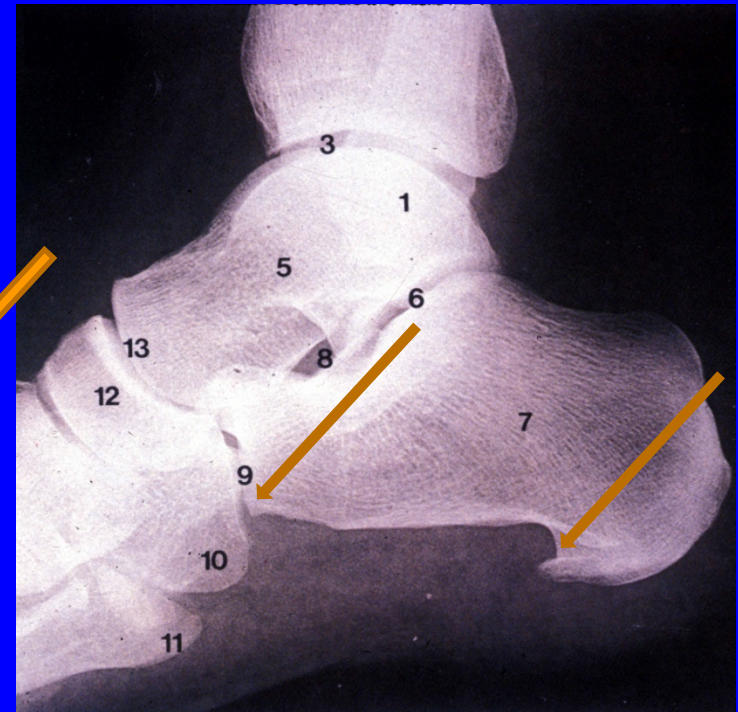


All asymmetries are not  
necessarily RSD

# Generator Identification: Plain Films

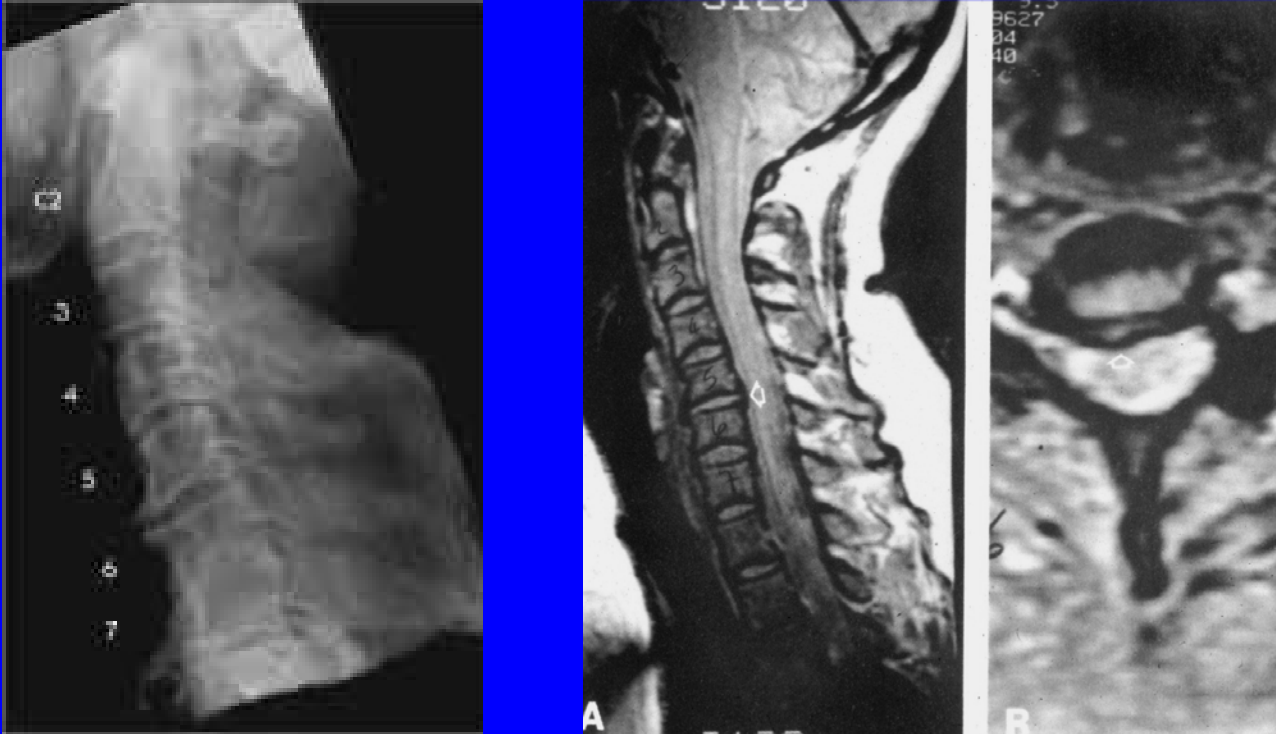


Missed left hip DJD



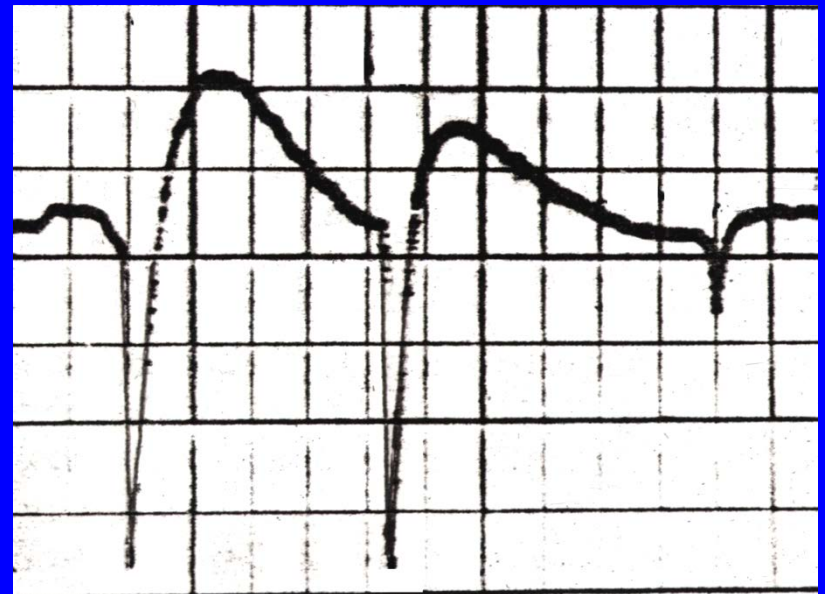
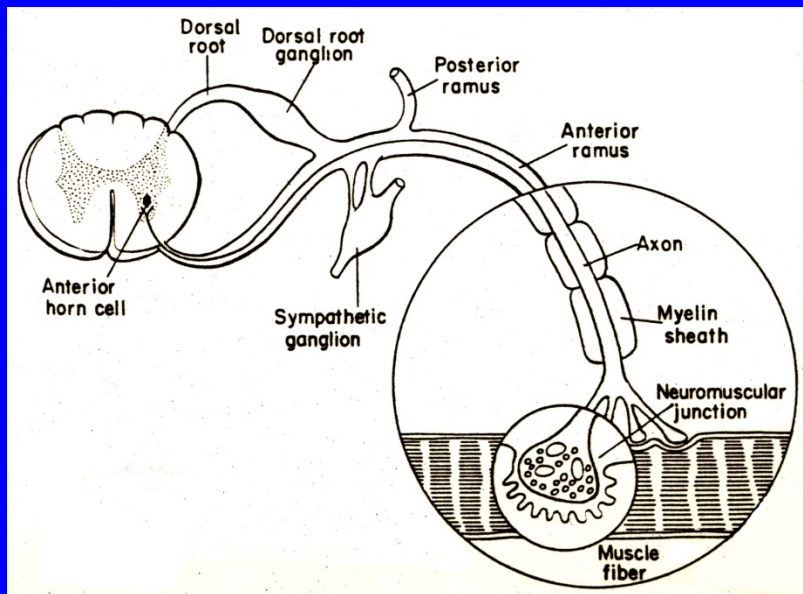
Spurs & joint subluxation

# Advance Imaging



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

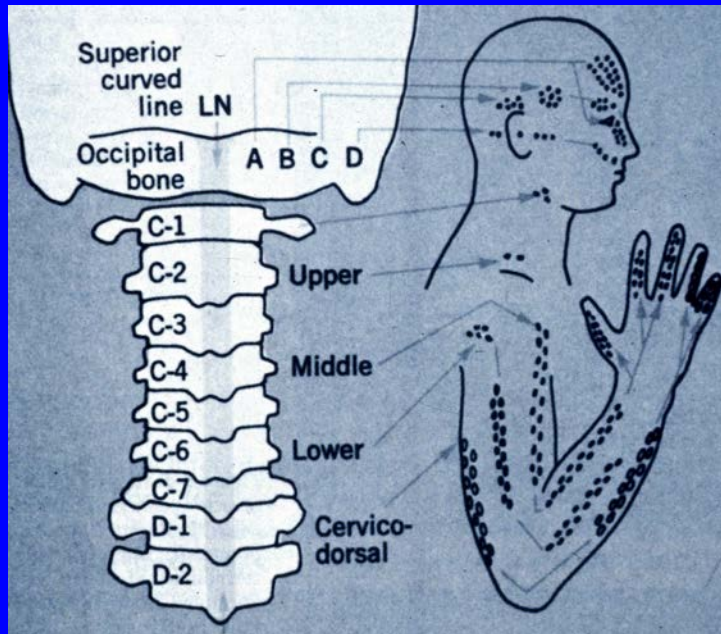
# Electrodiagnostic Studies



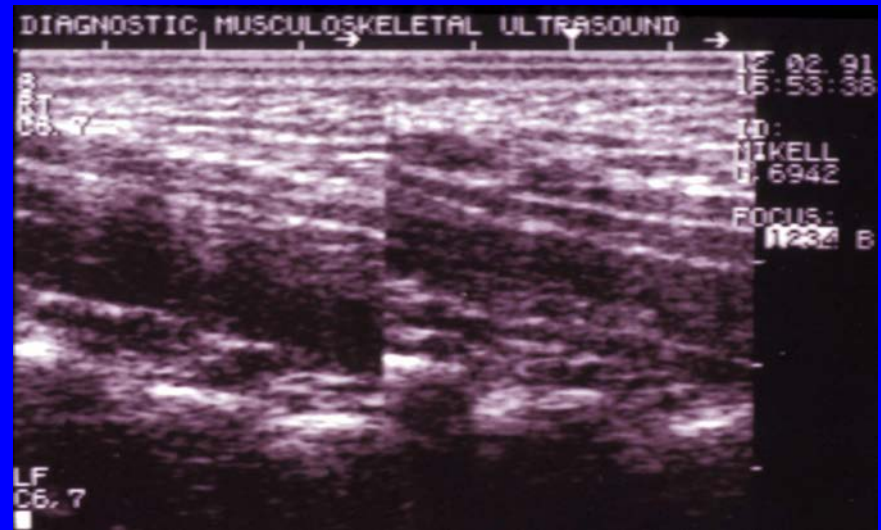
Don't miss associated nerve root irritation, mono-neuropathies or peripheral neuropathy.



# Diagnostic Ultrasound



Known sclerotomal maps



Ligaments are richly supplied by sympathetic nerve fibers.

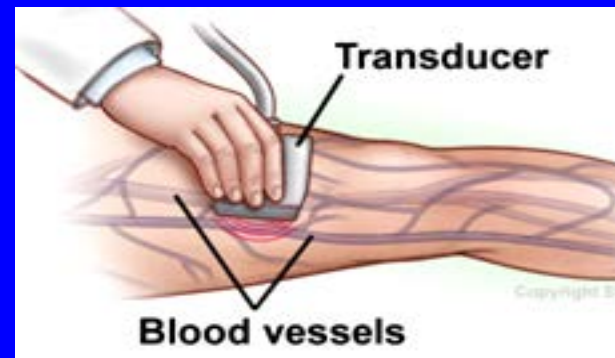
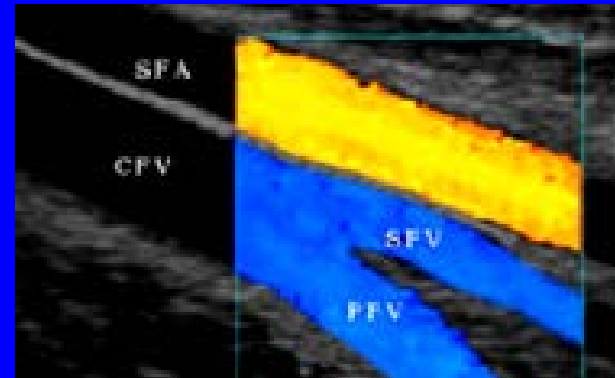
# Other Diagnostic Tests: Laboratory

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



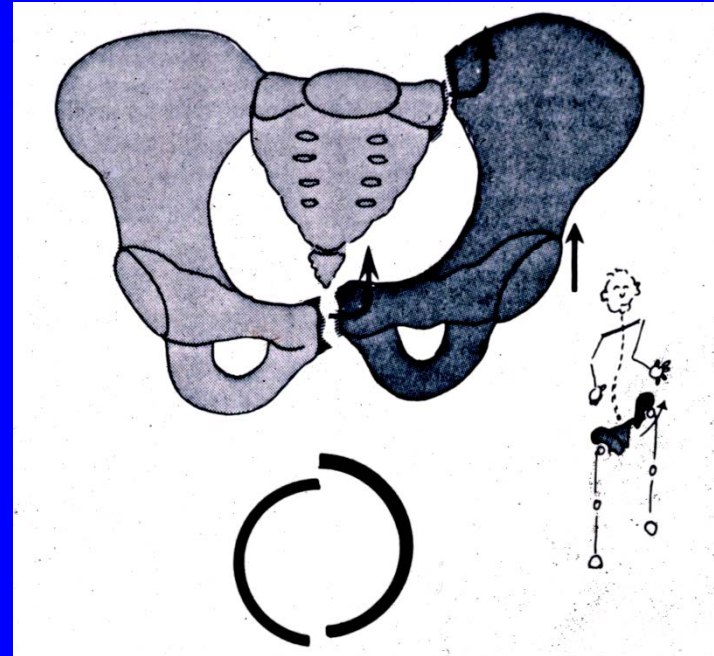


# Vascular Doppler & Duplex



Treat comorbid PAD and Venous Disorders

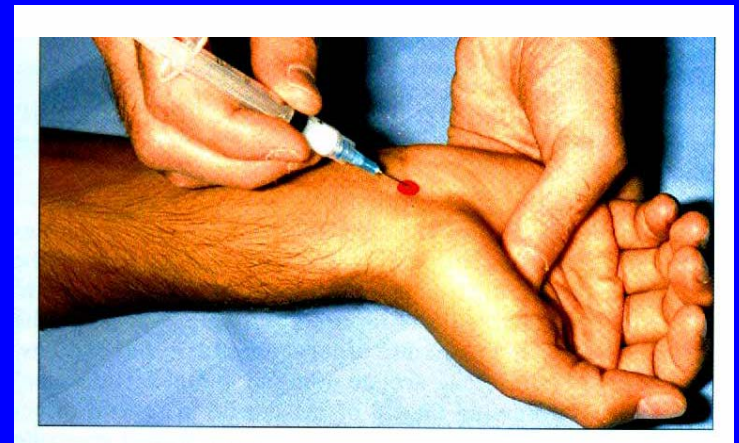
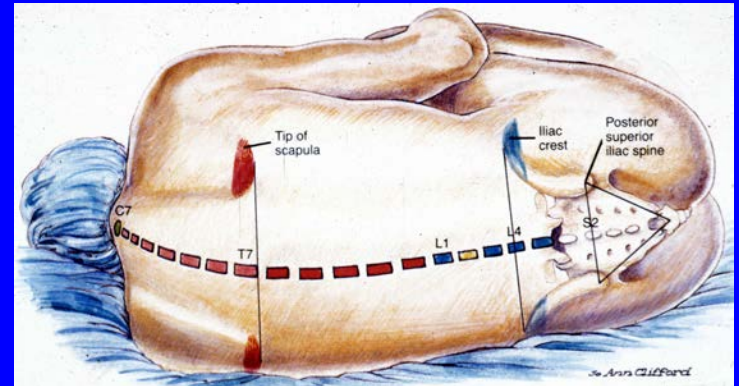
# Gait & Posture Analysis



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

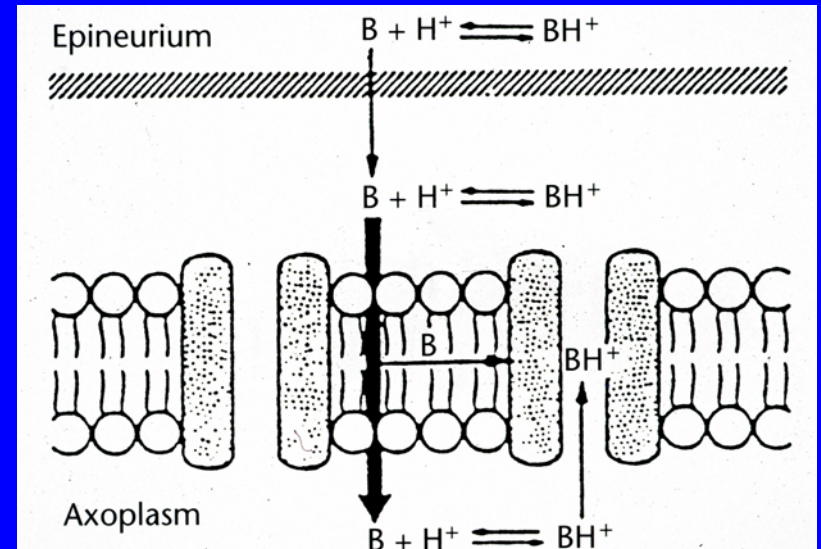
# Treatment Options: Steroid Injections

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



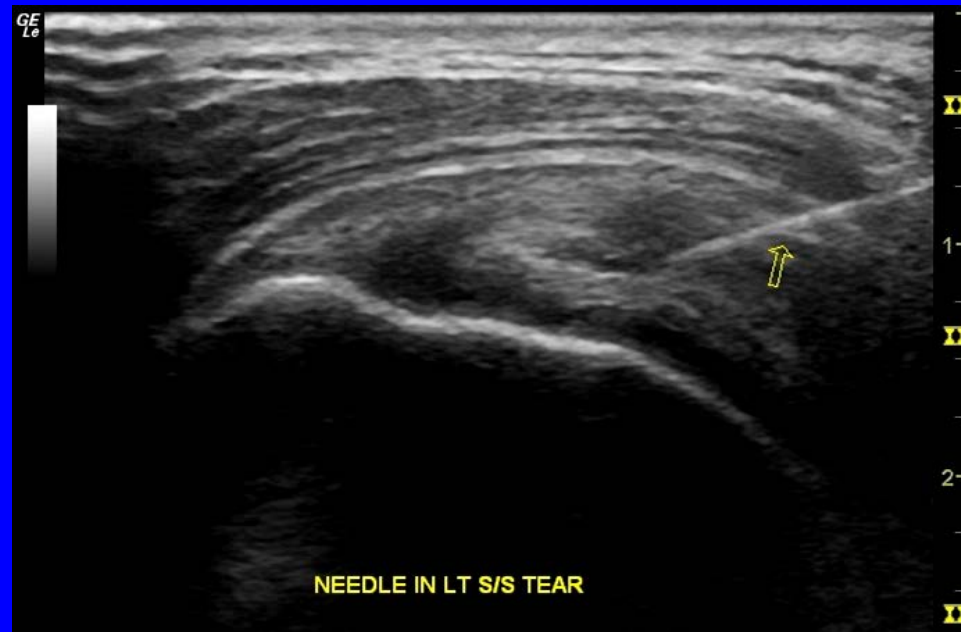
# Anesthetic Injections

- 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

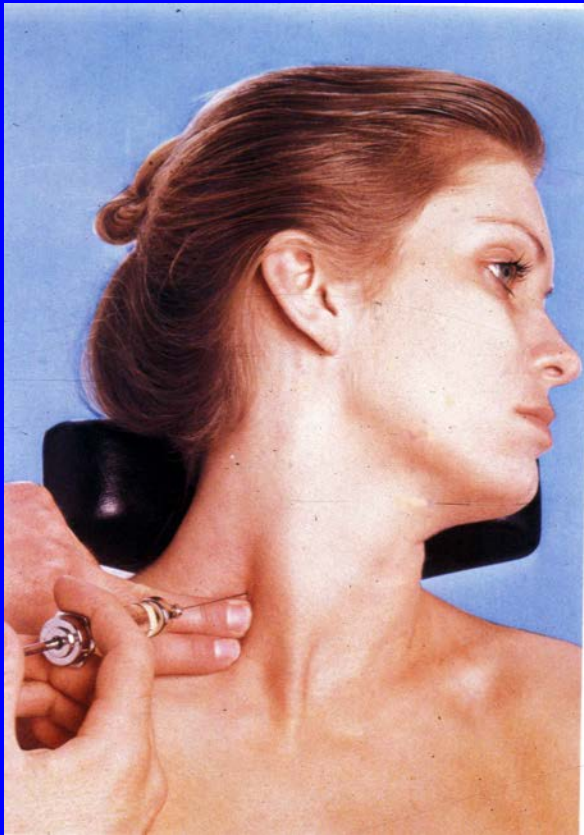
- Objectively proven on SSR (Thermography).
- Allows voltage gated approach to treatment.
- Efficacy increases with successive use.
- Electro-poration.



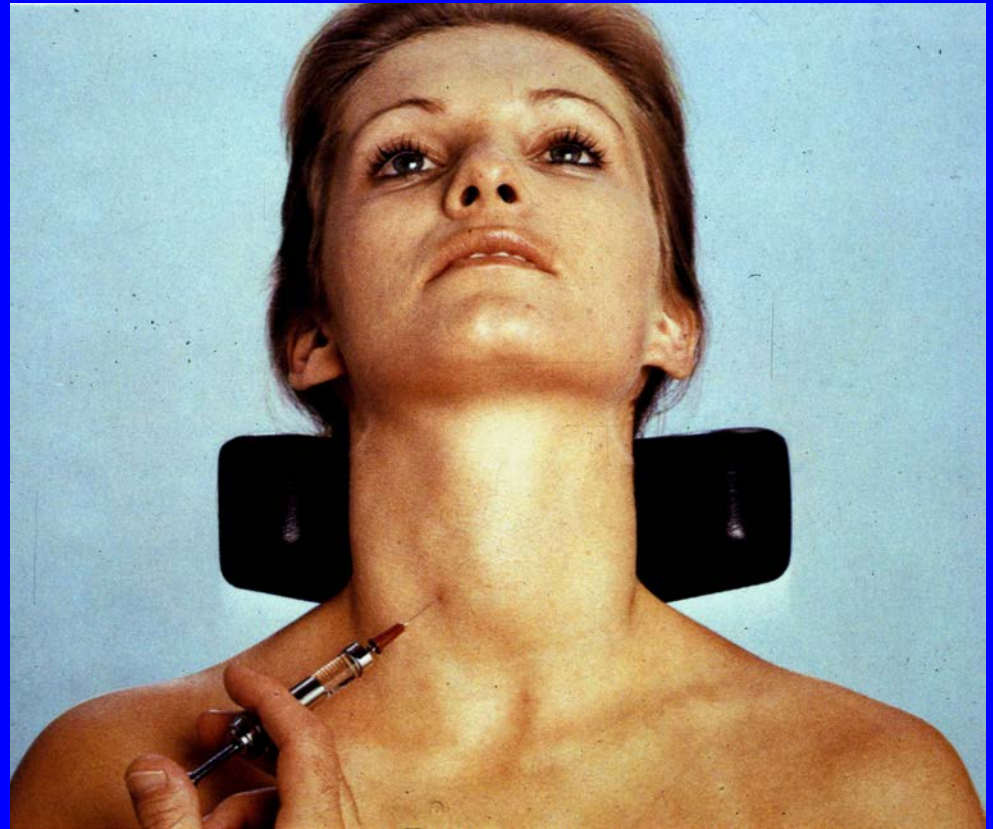
Electric Sympathetic Block: Current Theoretical Concepts & Clinical Results;  
Schwartz, R; J Of Back & Musculoskeletal Rehabilitation; 1998; 10:31-46.



# Cervical Plexus & Stellate Block



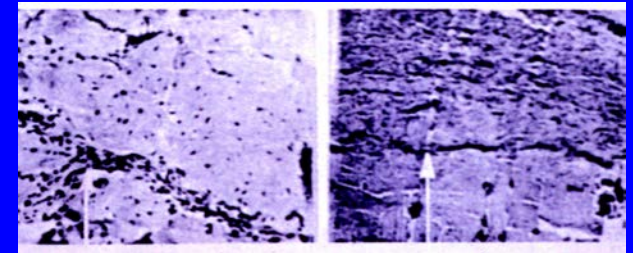
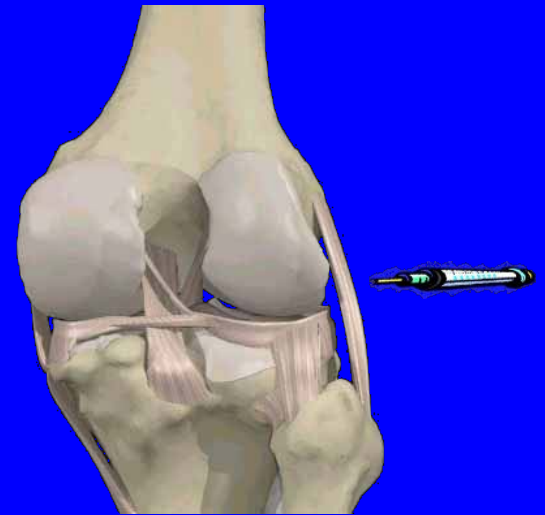
Cervical Plexus



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.

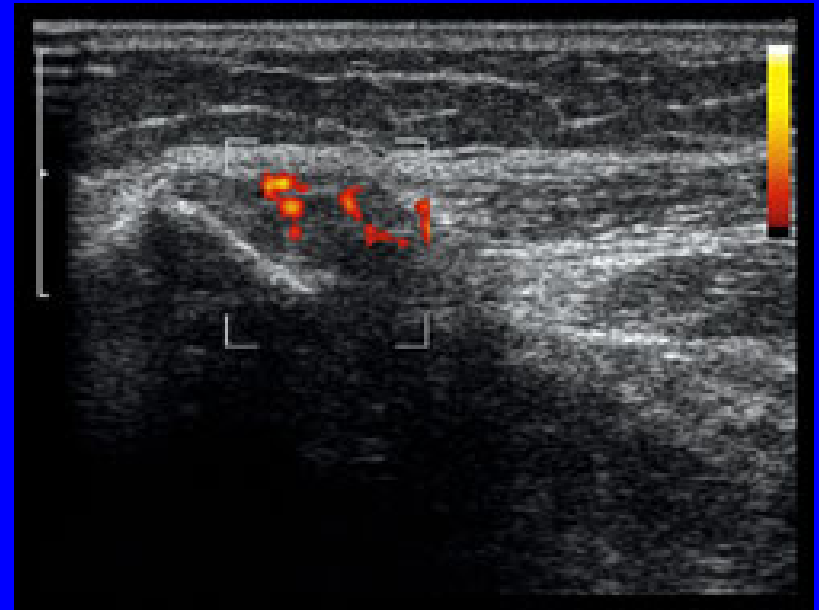


Pre

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

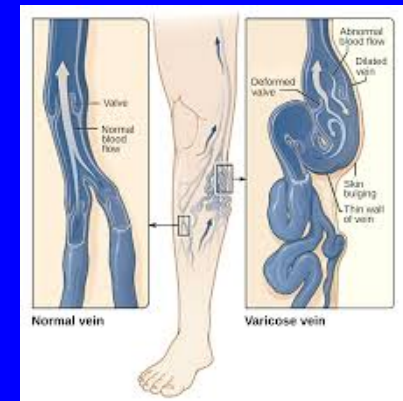
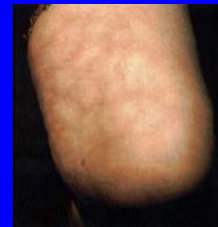
# Immuno-Inflammatory Approach

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



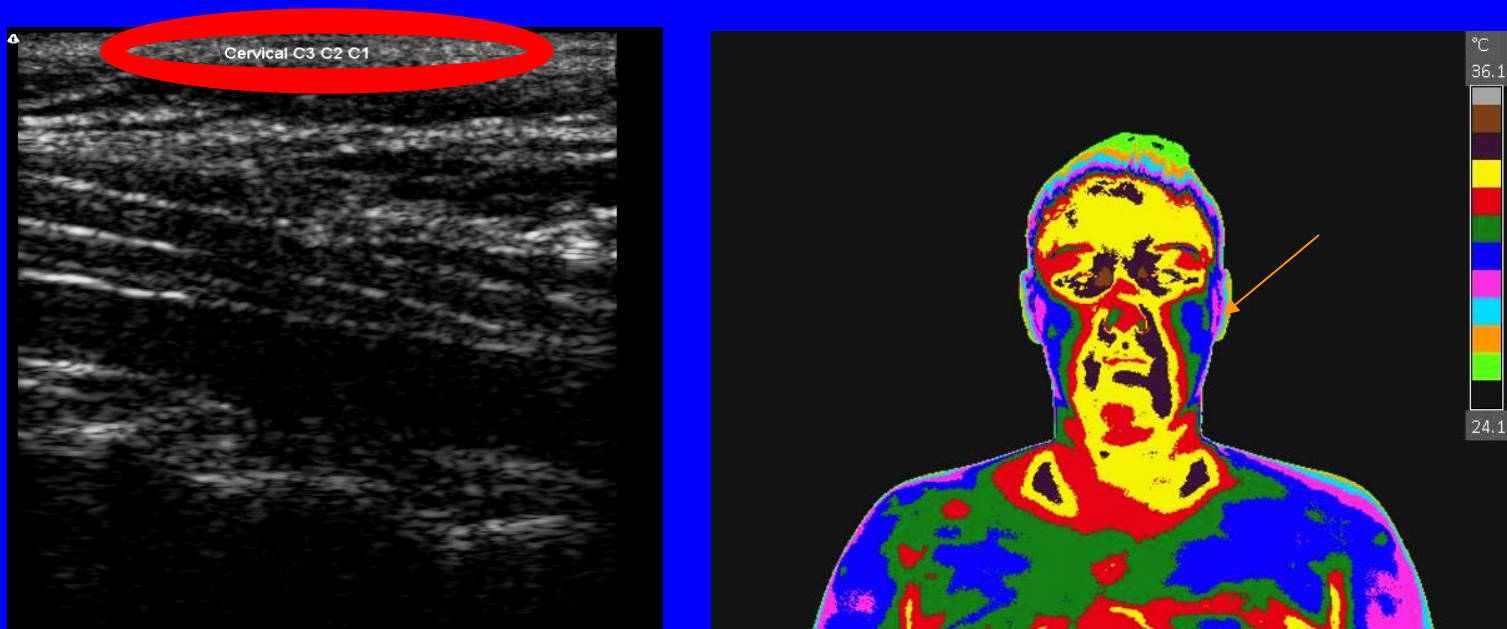
# Vasodilators & Vascular Medicine

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





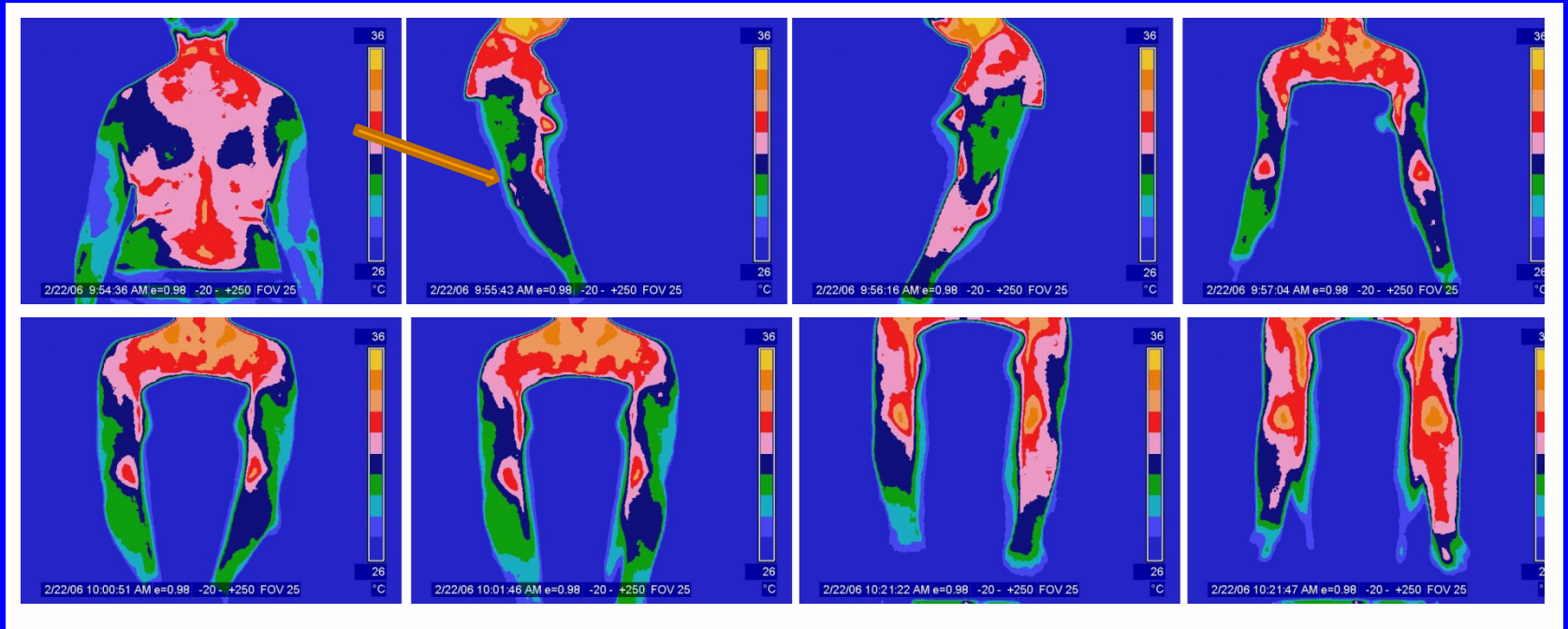
# Putting It Together



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

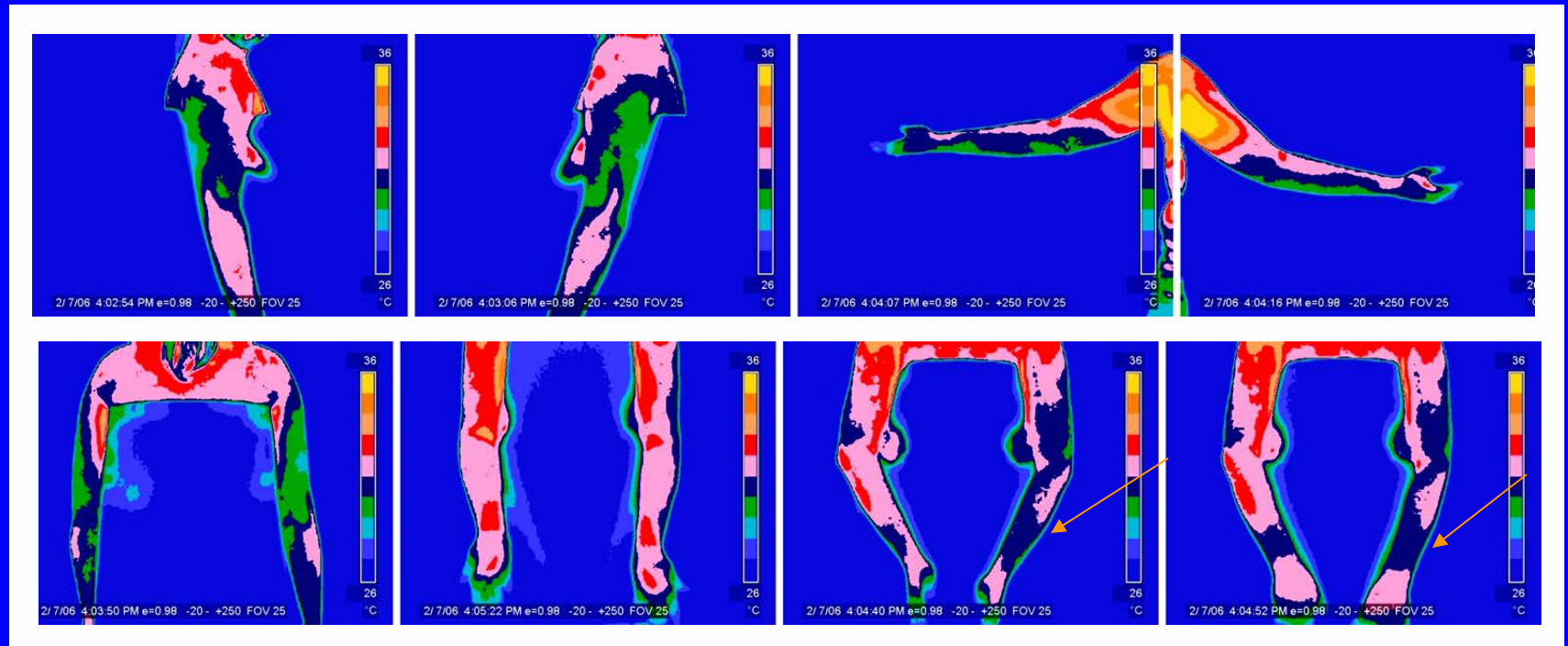


# Block Above & Treat Below



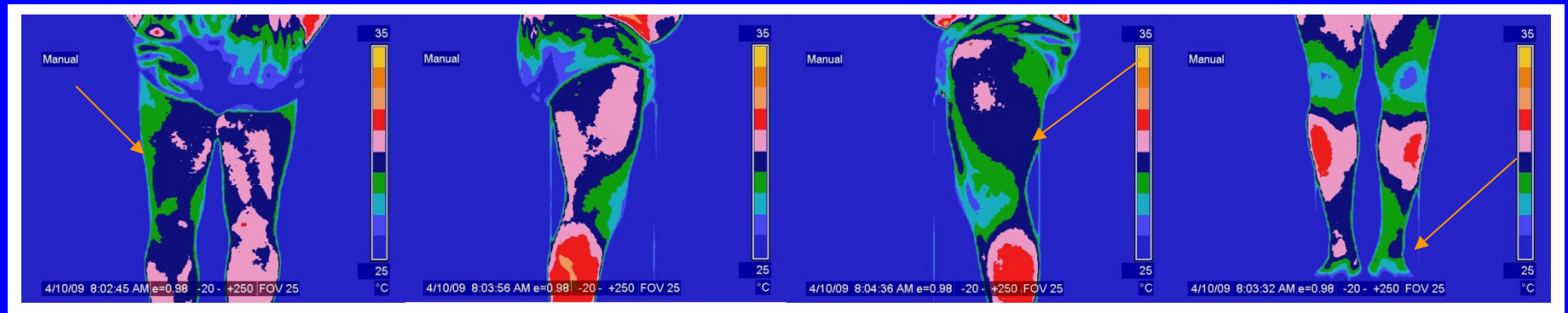
Right elbow pain assoc. with a history of 2nd & 3rd finger vasospasm. Stellate block followed by US guided percutaneous tenotomy brought lasting relief.

# Block Above May Treat The Source



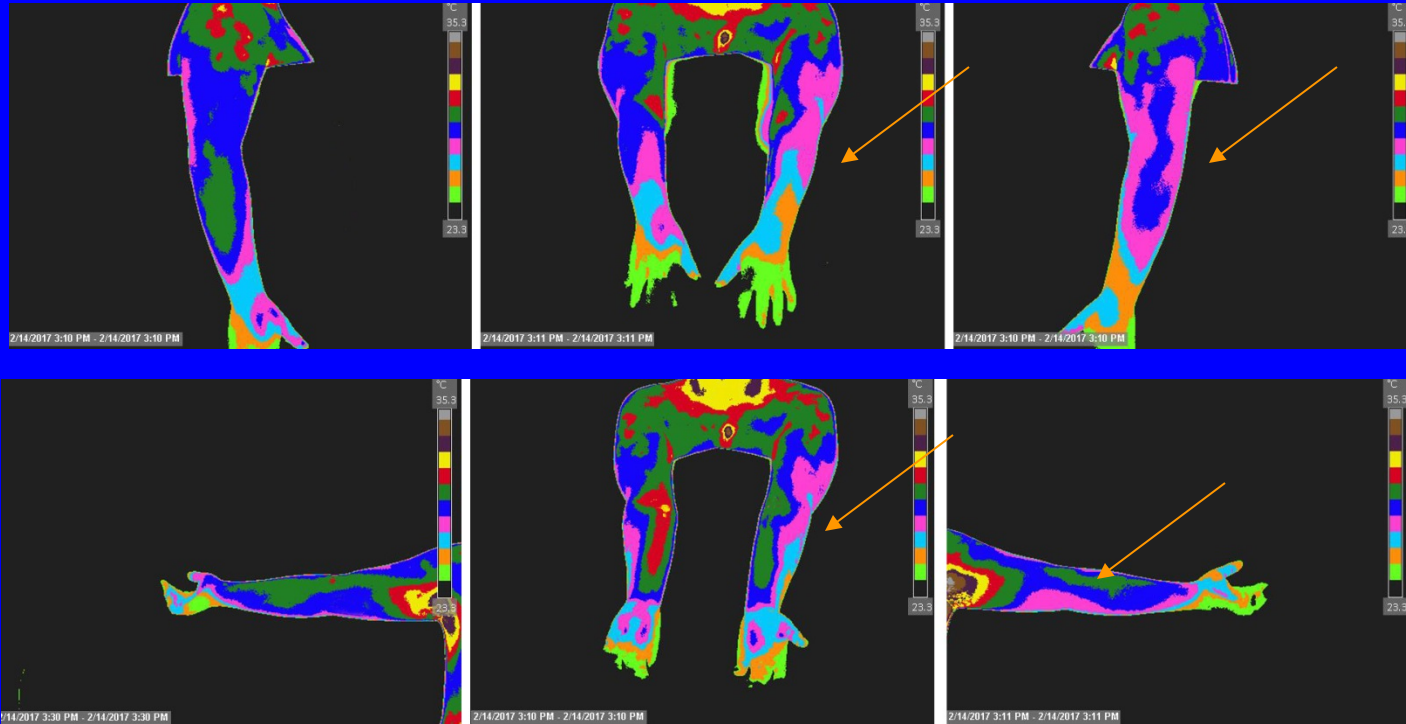
Left shoulder adhesive capsulitis. Shoulder ROM improved with left C56 PVNB.

# Block Above & Treat Comorbid Disease



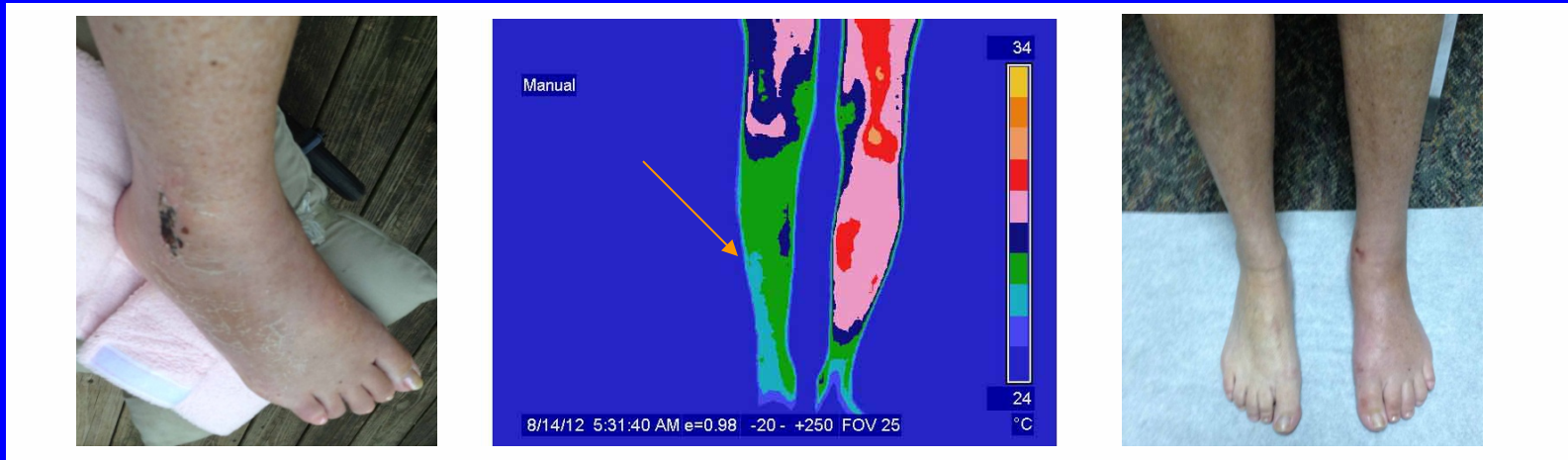
S/P left Morton's neuroma resection x 2. PMH + for NIDDM, HTN & venous reflux. Sympathetic block at L45 followed by treatment of comorbid conditions finally provided lasting relief.

# 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.

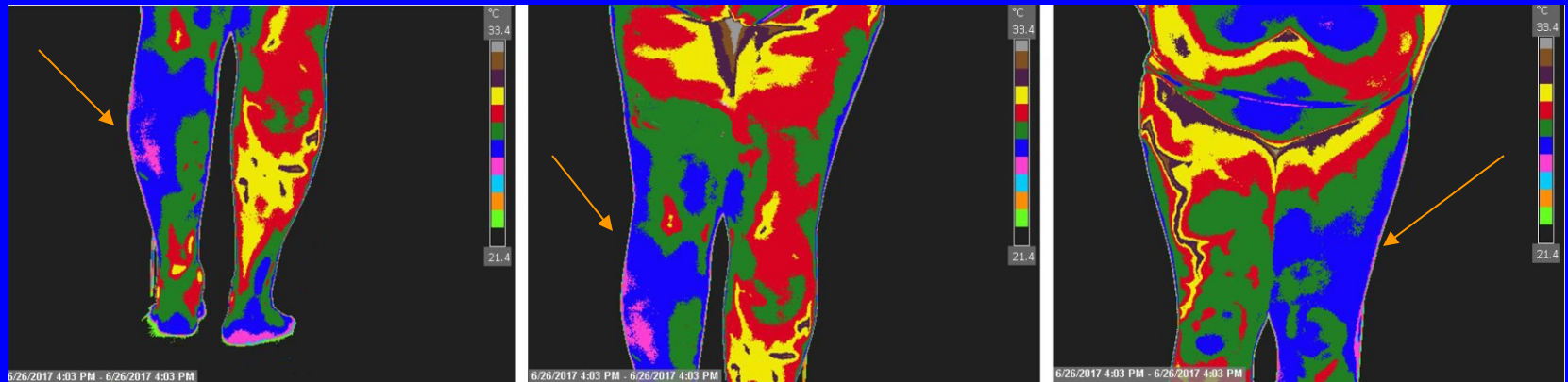
# RSD Reversed With Stem Cell



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

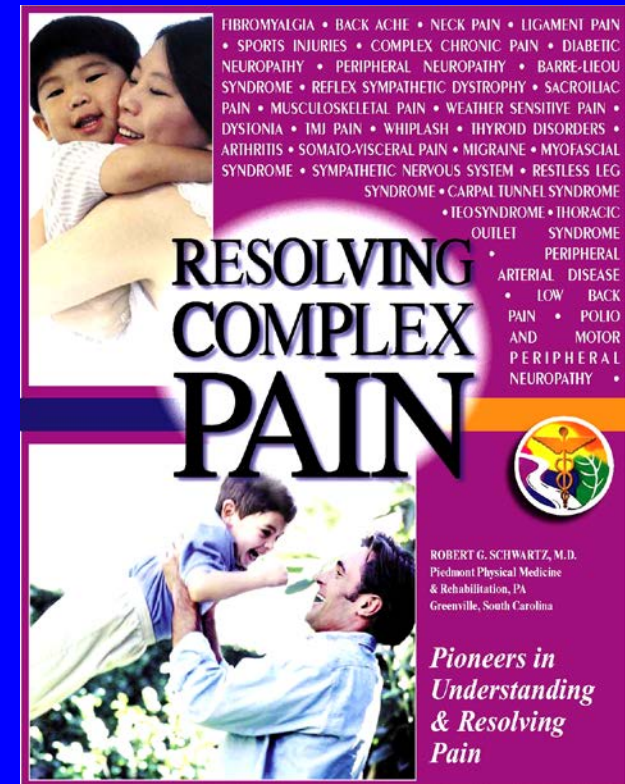
SC RSD Support Group

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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