



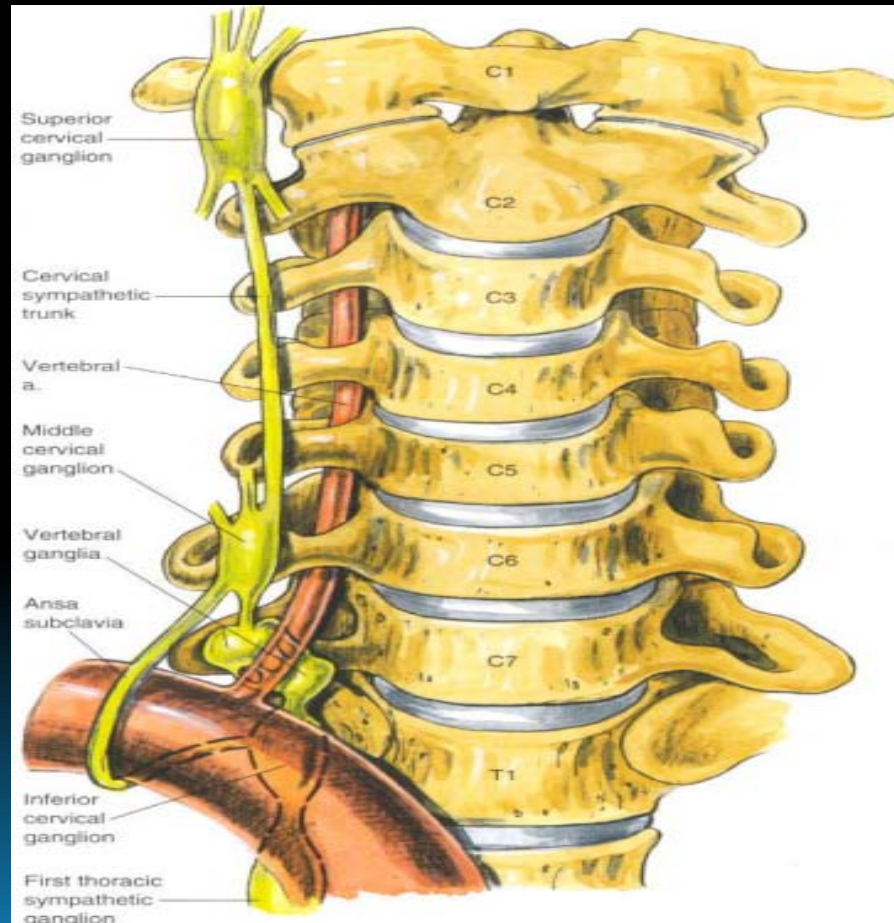
# RSD IN THE ATHLETE

*Melvin R. Manning, MD*

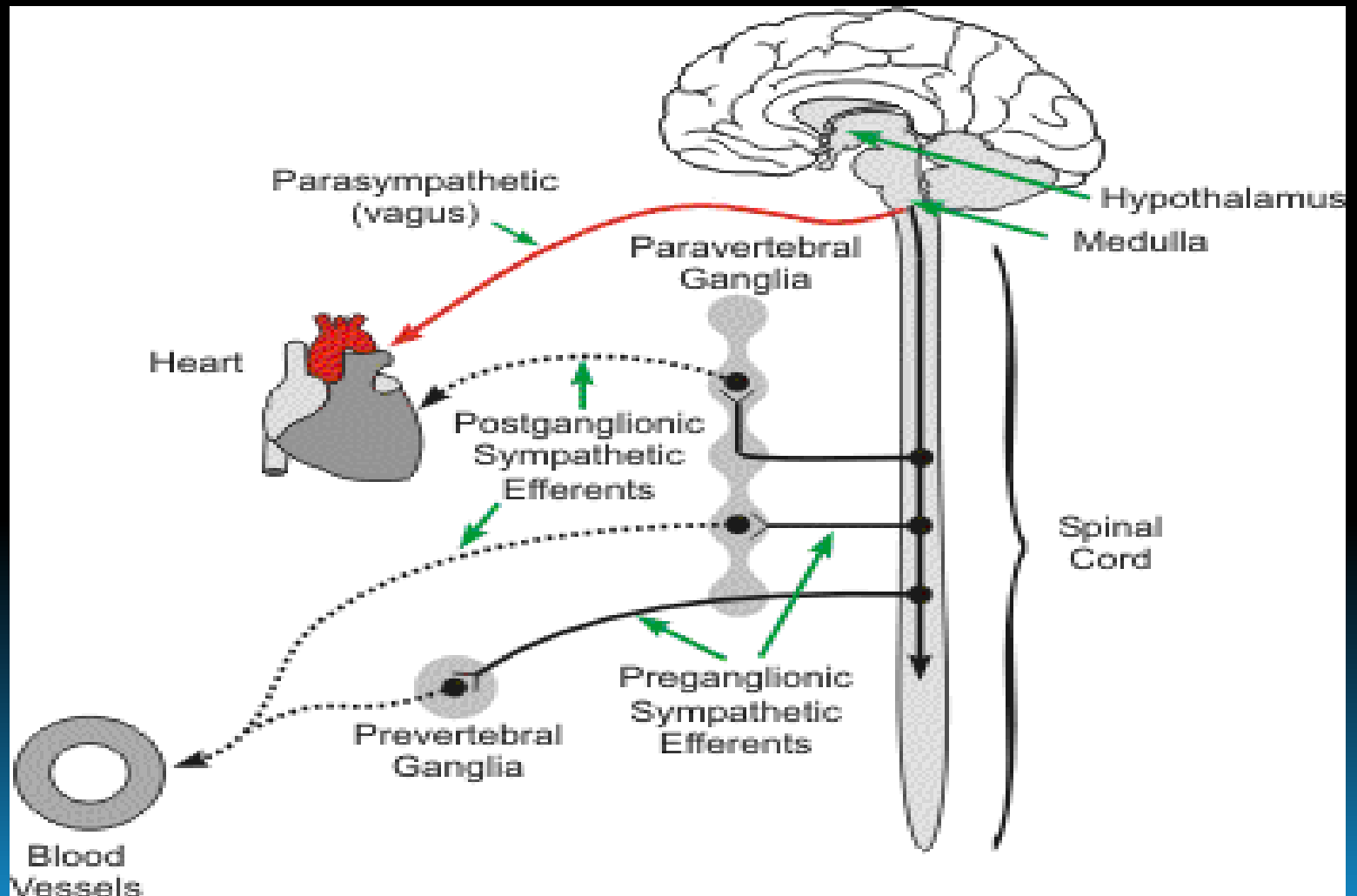
# Anatomy, Etiology, and Diagnosis

- Classification of RSD Injuries
- Mechanisms of Nerve Injury
- Regeneration and Recovery of Nerve Function
- Electrodiagnostic Testing

# Sympathetic Chain Anatomy



# Sympathetic functional anatomy



# Constellation of Symptoms and Exam Findings

- **Burning pain**
- **Increased skin sensitivity**
- **Skin temperature changes (warmer or cooler than opposing extremity)**
- **Skin color changes (blotchy, purple, pale, red)**
- **Skin texture changes (shiny, thin, sweaty)**
- **Changes in nail and hair growth patterns**
- **Stiffness and swelling in affected joints**
- **Decreased ability to move affected extremity**

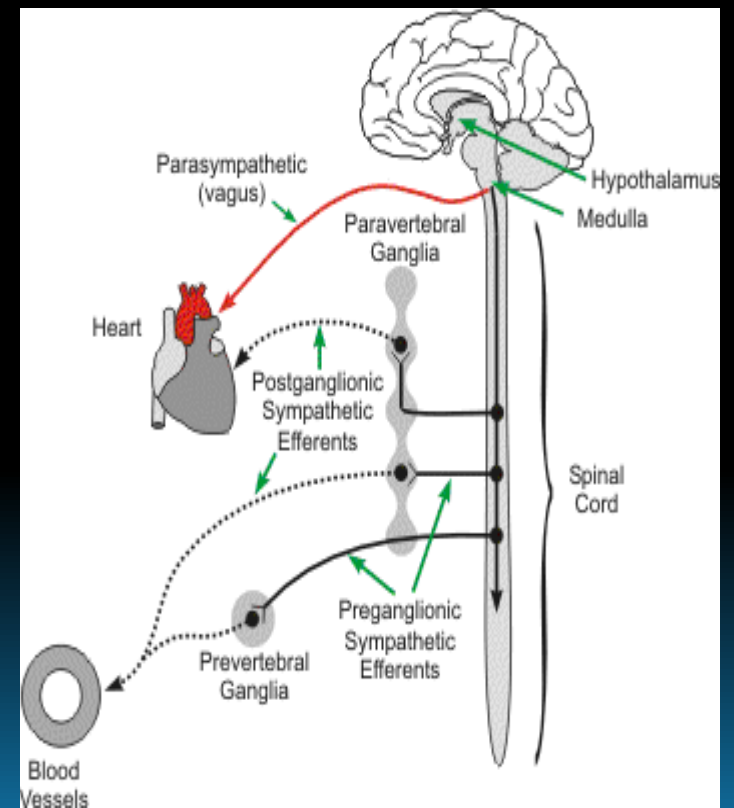
# Classification

- CRPS Type I (also referred to as RSD) - cases in which the nerve injury cannot be immediately identified
- CRPS Type II (also referred to as Causalgia) - cases in which a distinct "major" nerve injury has occurred
- CRPS is best described in terms of an injury to a nerve or soft tissue (e.g. broken bone) that does not follow the normal healing path
- CRPS development does not appear to depend on the magnitude of the injury. The sympathetic nervous system seems to assume an abnormal function after an injury.
- Since there is no single laboratory test to diagnose CRPS, the physician must assess and document both subjective complaints (medical history) and, if present, objective findings (physical examination).

# Criteria for Diagnosing

- The presence or absence of an initiating noxious event, or a cause of immobilization
- Continuing pain, allodynia, or hyperalgesia with which the pain is disproportionate to any inciting event
- Evidence at some time of edema, changes in skin blood flow (skin color changes, skin temperature changes more than 1.1°C difference from the homologous body part), or abnormal pseudomotor activity in the region of the pain
- This diagnosis is excluded by the existence of conditions that would otherwise account for the degree of pain and dysfunction

# MECHANISM OF HOW IT ALL STARTS



# DIAGNOSTIC TESTING

**There is no specific blood test or other diagnostic test for RSD. X-rays can show thinning of bones (osteoporosis). Nuclear bone scans can show characteristic uptake patterns which help diagnose RSD.**



# ELECTRODIAGNOSTIC TESTING

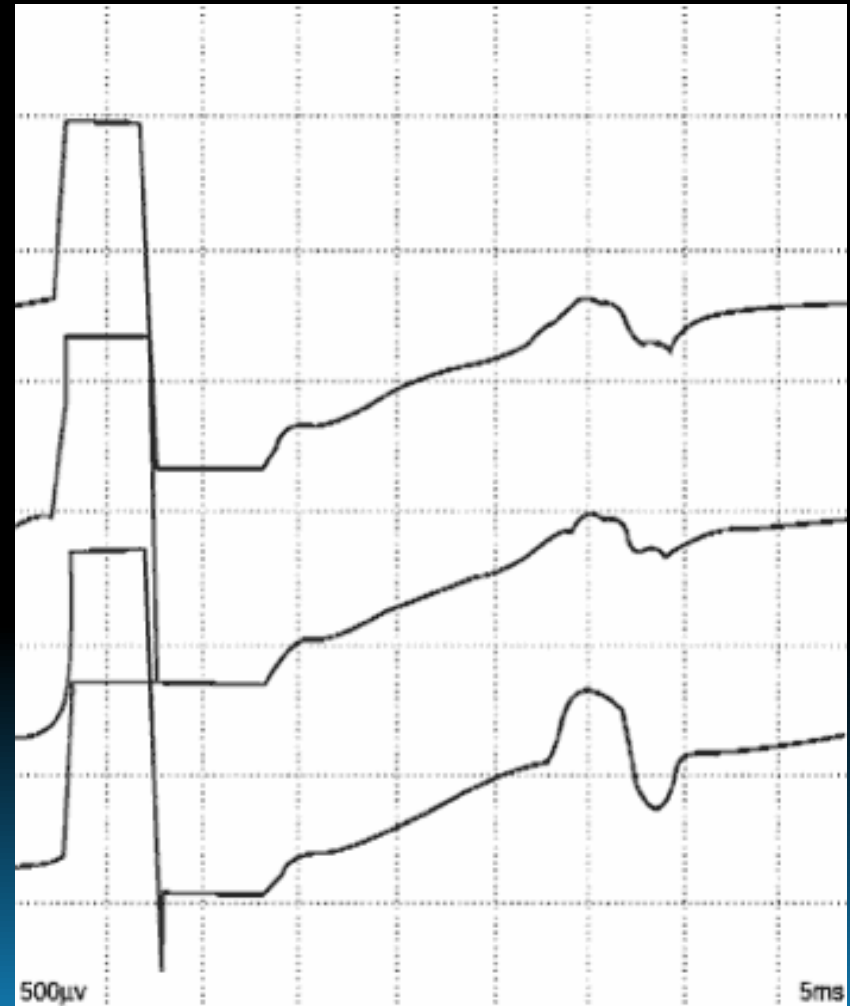
- Nerve conduction studies “NCV”
- Electromyography “EMG”

# NERVE CONDUCTION STUDIES

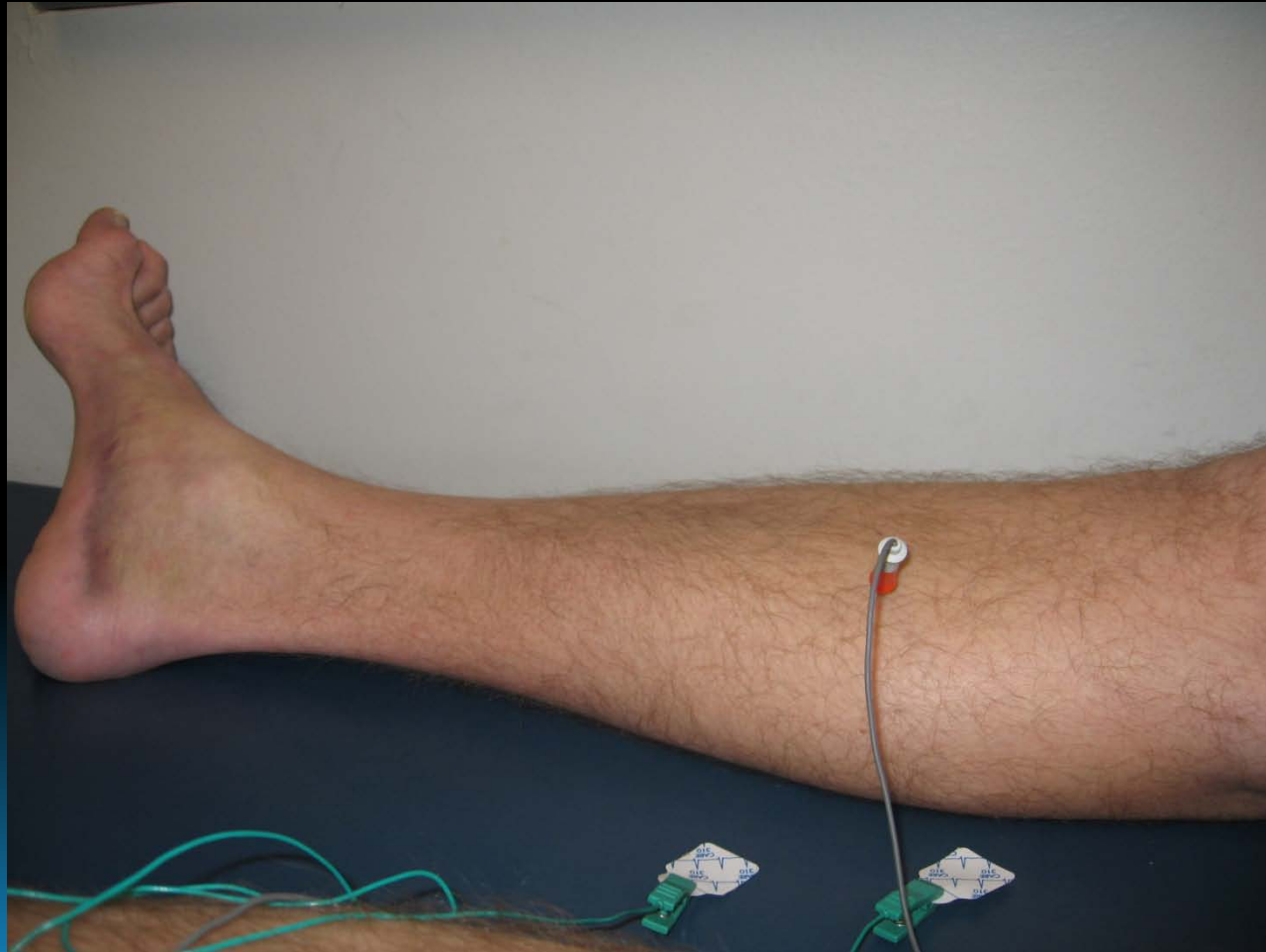
- Based upon principal of physics  
*Velocity=Distance/Time*

# CONDUCTION RESPONSE

- Speed
- Amplitude



# ELECTROMYOGRAPHY

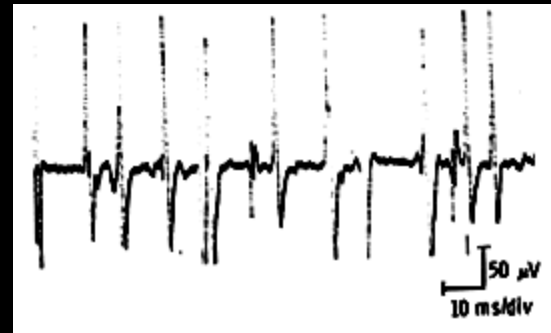


# EMG wave forms

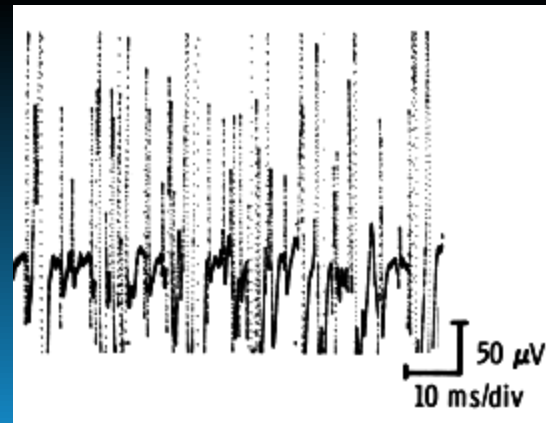
Mild effort



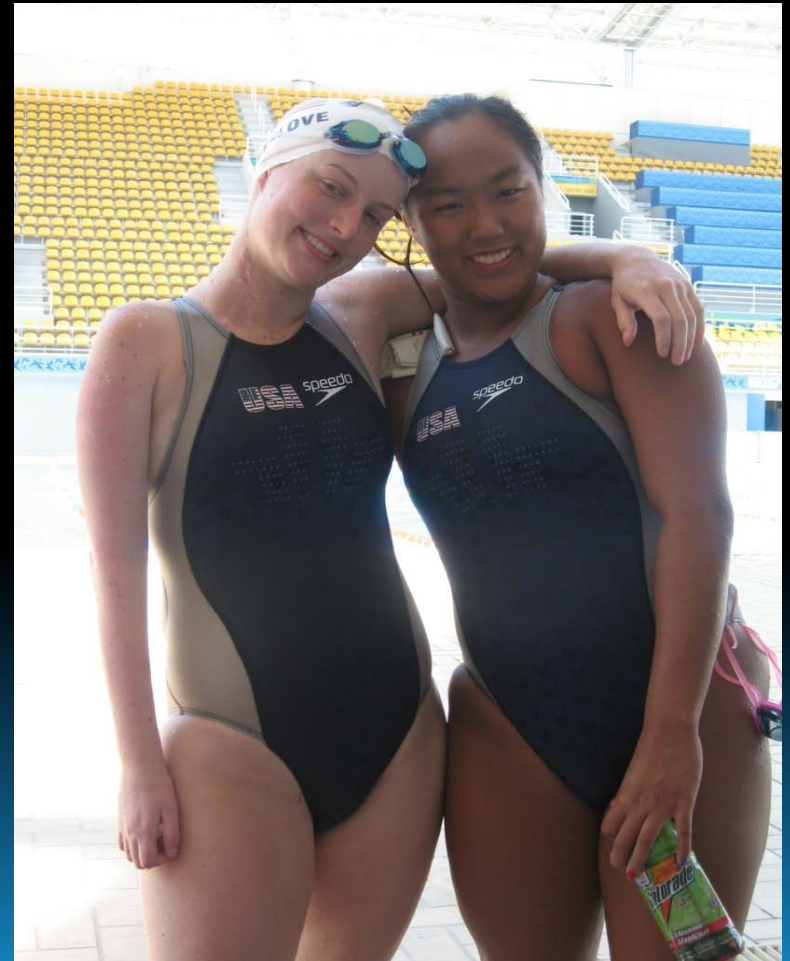
Moderate effort



Full effort



# Mechanism of Nerve Injuries in Sports



# TREATMENT

- Exercise
- Psychotherapy to relieve stress, anxiety and depression
- Sympathetic nerve blocks
- Spinal cord stimulation
- Intrathecal drug pumps
- Medications:
  - Topical analgesics
  - Anti-seizure drugs
  - Antidepressants
  - Corticosteroids
  - Opioids

# REMEMBER THE BASICS

