

# ***Non-Invasive Treatment of Nerve Entrapment Syndromes with the Sonotron, A Pulsed Wave Radio Frequency Therapeutic Device***

## **Clinical Study Summary**

### **Abstract:**

- Clinical study of fifty patients
- Determine efficacy of pulsed wave radio frequency device (Sonotron)
- Common nerve entrapment syndromes - Carpal Tunnel & Tarsal Tunnel Syndromes
- Clinical comparison of physiologic studies of nerve conduction velocity and electromyography

### **History:**

- **Sonotron**
  - Non-invasive device
  - Modulated RF energy
  - Visible and Audible
  - Constant preset distance
  - Within electromagnetic spectrum of medical therapeutic devices
  - Few contraindications
- **Previous Studies**
  - Animal model studies
  - Long Island Jewish Medical Center
  - University of Wisconsin School of Veterinary medicine
  - Placebo Controlled Human Model studies

### **Nerve Entrapment Syndrome:**

- Compressive neuropathy
- Hand - Median commonly known as CTS.
- Foot - posterior tibial neuropath commonly know as TTS.

### **Subjective Findings**

- Pain
- Numbness and weakness
- Decreased function as reported by patient

### **Objective Findings**

- Decreased muscle power of hand/foot
- Positive Tinel sign
- Positive Phalen sign
- Visual Inspection
- X-ray analysis
- EMG/NCV studies

### **Epidemiology**

- More common in female than males
- Post traumatic
- Pregnancy
- Repetitive stress disorders
- Cumulative occupational trauma syndromes

### **Present Treatments Available**

- Medication
- Injection
- Splinting
- Physical Therapy - Ultrasound, Diathermy, Parafin
- Sonotron - pulsed RF device
- Surgery - last option

- Material & Methods:**
- Patients selected at random
  - No preference for age, gender or occupation
  - Physical exam by physician
    - Range of motion with goniometer
    - Grip strength with dynamometers
    - Sensory exam with pinwheel and calipers
    - Patient questionnaires - VAS
    - X-ray study
    - EMG/NCV study

- Treatment Regimen** - Sonotron Device - 3 Treatment Units (TU) applied once weekly over affected area.
- Total of 12 TUs
  - TU consists of a microprocessor controlled 15 second output of corona discharge.
  - After regimen, repeat EMG/ NCV & phys. exam.

- Results:**
- Carpal Tunnel Syndrome** 21 of 30 patients yielded improvement - *70% positive*
- Nerve conduction velocity latencies
  - Amplitudes of response
  - Grip and pinch strength
  - VAS (Visual Analog Scale)
  - Decreased pain and improved function

- Tarsal Tunnel Syndrome** 3 of 5 yield improvement - *60% positive*
- Nerve conduction latency velocities
  - Weight bearing and function

**Complications:** None

- Discussion:**
- OSMI-NJ study objectively documents improvement in nerve entrapment syndromes.
  - Sonotron Device - Hypothesized via high penetrance of soft tissue with low frequency sound waves.

- Conclusion:**
- Effective
  - Non-Invasive modality
  - Conservative Management

- Advantages:**
- High Patient compliance
  - Ease of use
  - Painless
  - Long term effect
  - Excellent adjunctive modality