

# Clinical Summarization Report

A Pain Management  
Treatment Perspective

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## Electroanalgesia for Neuropathy: The NeuroMed Delivery System in Clinical Practice

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### Introduction

Neuropathy, particularly diabetic peripheral neuropathy (DPN) and chemotherapy-induced neuropathy (CIN), presents a significant challenge in clinical pain management. Traditional pharmacologic interventions, such as gabapentinoids, antidepressants, and opioids, often come with limited efficacy and undesirable side effects.

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The NeuroMed Electroanalgesia Delivery system offers an FDA-cleared, non-invasive alternative for managing neuropathic pain. Unlike conventional transcutaneous electrical nerve stimulation (TENS), electroanalgesia utilizes higher-frequency electrical currents to penetrate deeper tissue layers, modulating nerve activity and promoting neural recovery.

## **Mechanism of Action**

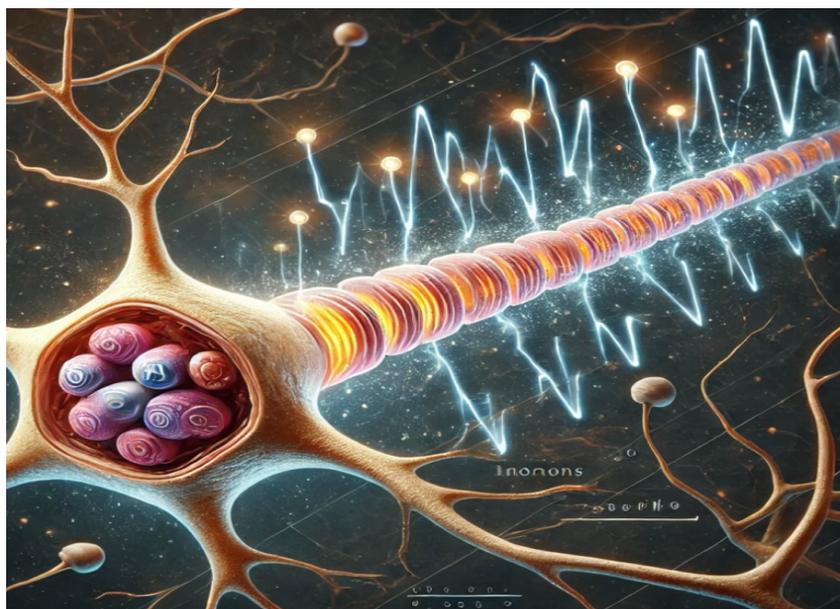
NeuroMed's Electroanalgesia treatment delivers high-frequency pulsed electrical (energy) currents (8,300–10,000 Hz) through targeted Vaso cup electrodes placed on the affected region. The primary mechanisms include:

- **Depolarization Blockade** – High-frequency electrical stimulation interferes with nociceptive signaling by reducing repetitive firing of C-fibers and A $\delta$ -fibers.
- **Endogenous Pain Modulation** – Stimulates descending inhibitory pathways, increasing endorphin and enkephalin release in the spinal cord.
- **Increased Circulation & Tissue Oxygenation** – Reduces ischemic pain and enhances nerve regeneration.
- **Anti-Inflammatory Effects** – Decreases pro-inflammatory cytokine activity, reducing neurogenic inflammation.

## **Chemicals release in the body**

Electronanalgesia, a form of pain relief using electrical stimulation, influences the nervous system by modulating neurotransmitter release and altering pain perception. When electrical energy is applied to nerves, several key chemicals are released that contribute to pain relief:

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1. Endorphins and Enkephalins – These are natural opioids produced by the body that help reduce pain perception by binding to opioid receptors in the brain and spinal cord.
2. Serotonin (5-HT) – Plays a role in pain modulation by inhibiting pain signals in the central nervous system.
3. Dopamine – Involved in the reward system and pain relief, dopamine release can enhance mood and contribute to analgesic effects.
4. Acetylcholine – Can influence pain pathways by modulating neurotransmission in the nervous system.
5. Gamma-Aminobutyric Acid (GABA) – An inhibitory neurotransmitter that helps suppress pain signals in the spinal cord and brain.
6. Substance P (Reduced Levels) – Substance P is involved in transmitting pain signals. Electrical stimulation can decrease its release, reducing pain perception.
7. Nitric Oxide (NO) – Involved in pain modulation and vasodilation, affecting blood flow and inflammation.

These chemical changes help explain why Electronanalgesia, can be more effective for managing pain.

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These physiological effects make electroanalgesia distinct from standard TENS therapy, which operates at much lower frequencies (typically 1–250 Hz) and does not achieve the same level of nerve membrane stabilization.

## Clinical Applications and Efficacy

Multiple case studies and clinical reports have demonstrated the effectiveness of electroanalgesia in neuropathy management.

### 1. Diabetic Neuropathy

Patients with DPN often experience burning pain, paresthesia, and hypersensitivity, which are difficult to manage with pharmacologic agents alone.

- A clinical report from Neuropathy Therapy Centers showed that over 90% of patients treated with NeuroMed's Electroanalgesia therapy experienced a significant reduction in pain and improved sensation after a full treatment course. (Clinical Summarization Report - Paul DeWeese, MD / Steven Woodring, MD *Diplomate, American Board of Anesthesiology*)

### 2. Chemotherapy-Induced Peripheral Neuropathy (CIPN)

Patients undergoing taxane- or platinum-based chemotherapy frequently develop CIPN, which remains one of the most dose-limiting toxicities in oncology.

- High frequency electroanalgesia by NeuroMed has demonstrated efficacy in reducing neuropathic symptoms in CIPN patients, with reports of improved nerve conduction and reduced allodynia.

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## 3. Post-Surgical and Chronic Neuropathic Pain

Post-operative neuropathic pain syndromes, such as those following lumbar discectomy or peripheral nerve trauma, respond favorably to electroanalgesia therapy by reducing central sensitization and preventing chronic pain progression.

### Advantages Over Conventional Therapies

Treatment Option	Mechanism	Side Effects	Long-Term Benefits
<b>Gabapentinoids</b>	Ca <sup>2+</sup> channel blockade	Sedation, dizziness	Symptomatic relief only
<b>Tricyclic Antidepressants</b>	Serotonin/norepinephrine reuptake inhibition	Cardiovascular risks, anticholinergic effects	Symptomatic relief only
<b>Opioids</b>	μ-receptor activation	Dependence, respiratory depression	Poor long-term efficacy
<b>Electroanalgesia (NeuroMed)</b>	High-frequency electrical blockade	Minimal	Symptomatic relief + potential nerve repair

Neuropathy, characterized by nerve damage leading to pain, tingling, or numbness, can be managed through various treatments, including electroanalgesia and conventional methods. Here's an overview of their effectiveness and cost considerations:

### Electroanalgesia

Electroanalgesia encompasses techniques, which involves applying electrical currents to the skin to alleviate pain.

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## Conventional Treatments

Conventional approaches often involve pharmacological interventions:

- Anticonvulsants: Medications like pregabalin and gabapentin are commonly prescribed for neuropathic pain. While pregabalin has shown some benefit, its effect is considered small. Gabapentin's efficacy is also uncertain, with studies yielding mixed results.
- Antidepressants: Tricyclic antidepressants (e.g., amitriptyline) and serotonin-norepinephrine reuptake inhibitors (e.g., duloxetine) are frequently used. Duloxetine and venlafaxine have demonstrated moderate-quality evidence in reducing diabetic neuropathic pain.
- Opioids: Typical opioids like oxycodone are generally not more effective than placebo for neuropathic pain. Atypical opioids (e.g., tramadol) may offer moderate benefits but are typically considered second or third-line treatments due to potential side effects and dependency risks.

## Cost Considerations

- Medications: The cost of anticonvulsants and antidepressants can vary widely based on insurance coverage, generic availability, and regional pricing.
- Opioids: While some opioids are inexpensive, the potential costs related to side effects, dependency treatment, and monitoring can be substantial.

## Implementation in Clinical Practice

### Patient Selection Criteria

Indicated for:

- Diabetic neuropathy (mild to moderate cases)
- CIPN
- Post-surgical neuropathic pain
- Failed conservative treatment with medications or PT

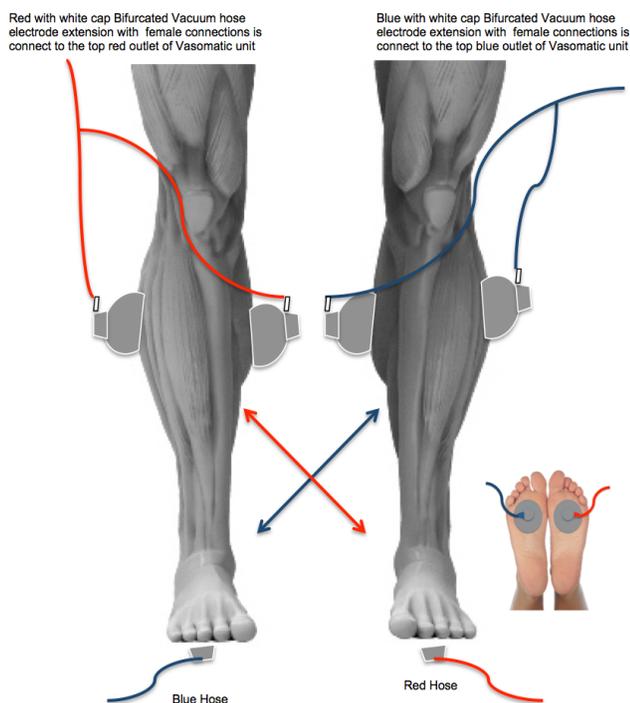
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## Contraindications:

- Patients with implanted electronic devices (pacemakers, defibrillators)
- Uncontrolled seizure disorders
- Active local infections at the treatment site

## Treatment Protocol

### Neuropathy Pad Placement:



- Session Duration: Typically, 25–30 minutes (depending on diagnosis)
- Frequency: 2–3 sessions per week for 8–12 weeks
- Maintenance Therapy: As needed for long-term symptom management

## Conclusion

For medical professionals treating neuropathic pain patients, the NeuroMed Electroanalgesia delivery system represents a viable, evidence-based alternative to pharmaceuticals. By directly modulating nerve function, it offers a pathway to both immediate pain relief and potential long-term neural recovery. Given its minimal side effect profile, it is an ideal option for patients seeking non-invasive pain management solutions.

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Also, Electroanalgesia methods offer a non-invasive and affordable option, for neuropathic pain patients. Conventional treatments, particularly certain antidepressants and anticonvulsants have demonstrated varying degrees of efficacy but may involve higher costs and potential side effects. It's essential for patients to consult with healthcare providers to determine the most appropriate and cost-effective treatment strategy tailored to their specific condition and medical history.

For more information, Contact us:

## **NEUROMED**

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