Scrambler Therapy:
A Safe and Effective Way to Treat Chemotherapy-induced Peripheral Neuropathy

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Introduction

Chemotherapy-induced peripheral neuropathy (CIPN) is a common, dose-limiting toxicity of agents such as taxanes, platinum compounds, and bortezomib, affecting up to 30–40% of cancer patients during or after treatment. CIPN causes numbness, tingling, burning pain, and sensory loss that may persist for years and impair function, balance, and quality of life. With few effective treatments, nonpharmacologic options are urgently needed. Scrambler Therapy is a noninvasive, FDA-cleared neuromodulation technique that uses surface electrodes placed on dermatomes surrounding the painful area to deliver dynamic "non-pain" signals designed to retrain maladaptive pain pathways. Unlike TENS, it aims to modulate C-fiber activity and reverse persistent pain signaling, producing rapid symptom reduction, improved function, and relief lasting weeks to months with minimal adverse effects.



What is Scrambler Therapy

- Noninvasive, FDA-cleared neuromodulation for chronic neuropathic pain.
- Uses surface electrodes placed on dermatomes surrounding (not within) the painful area.
- Delivers variable, synthetic "non-pain" signals intended to override and retrain maladaptive pain pathways.
- Mechanism differs from TENS: aims to modulate C-fiber activity and reverse entrenched pain signaling for longer-lasting relief.
- Sessions last 30–45 minutes, daily for 5–10 treatments.
- Demonstrated benefits in multiple studies, including for chemotherapy-induced peripheral neuropathy (CIPN):
  - Rapid pain reduction
  - Improved function and sensation
  - Durability lasting weeks to months
- Well-tolerated with minimal adverse effects.

Objectives

•Describe the clinical effectiveness of Scrambler Therapy (ST) for chemotherapy-induced peripheral neuropathy (CIPN) based on a single-site prospective study.

•Report symptom changes in pain, numbness, and tingling among patients treated at Johns Hopkins.

•Highlight safety, tolerability, and feasibility of delivering ST in a palliative/supportive care setting.

Materials and Methods

A prospective clinical evaluation of Scrambler Therapy (ST) was conducted in adults with chronic CIPN treated at Johns Hopkins in 2025.

Population: 20 patients with CIPN after neurotoxic chemotherapy.

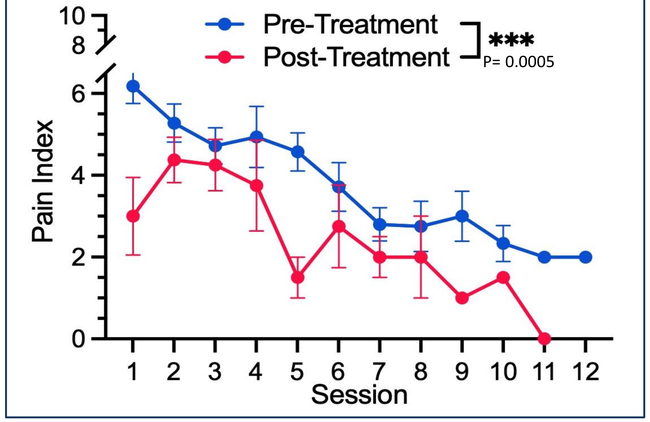
Intervention: Standard 10-session ST protocol delivered on consecutive weekdays using EKG electrodes placed on adjacent dermatomes.

Outcomes: Patient-reported change in pain severity (primary), with secondary assessment of numbness and tingling when available.

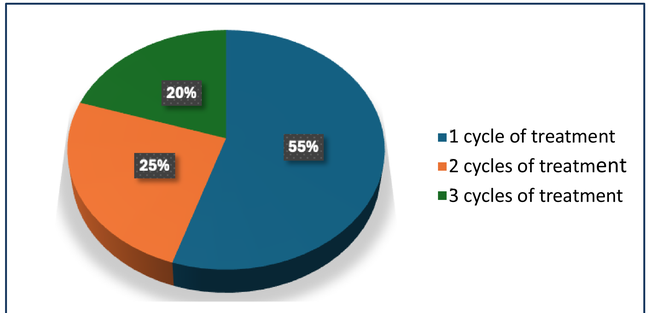
Safety: Adverse events were monitored across all treatment sessions.

Results

Reduction of Pain

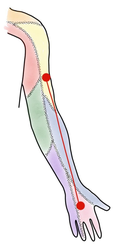


Durability



Electrode Placement

Upper Extremity





Lower Extremity



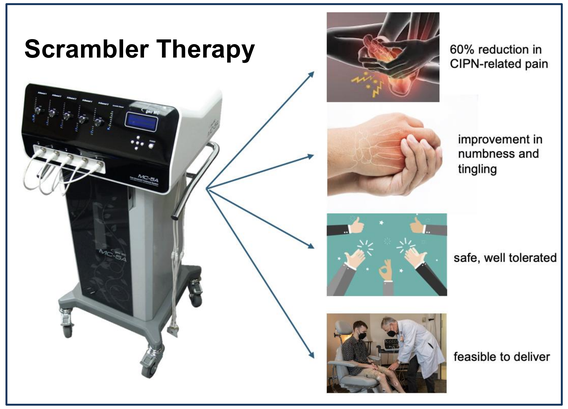


Safety



NO adverse reaction observed.

Conclusions



Clinical Implications

•ST may offer substantial relief for patients with few other effective treatment options for chronic CIPN.
•Non-opioid neuromodulation aligns with goals of minimizing medication burden and improving patient safety.
•Excellent tolerability suggests ST is appropriate for routine outpatient use.
•Real-world data from Hopkins, UCLA, and MD Anderson Cancer Center
• strengthen the rationale for larger controlled studies and improved access to ST.

Future Directions

- Optimize treatment protocols (dose, frequency, and duration).
- Identify patient subgroups most likely to benefit.
- Conduct larger, multicenter randomized clinical trials.
- Develop standardized training and certification programs for clinicians.
- Integrate wearable or digital tools to monitor response in real time.
- Explore combination strategies with rehabilitation or pharmacologic therapies.

Acknowledgement

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References

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