FPM

Faculty of Pain Medicine
ANZCA

2025 FPM SPRING MEETING

Treating the whole pain patient

24-26 October 2025,
Esplanade Hotel, Fremantle, WA

#painsm25

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Scrambler Therapy Another Tool for Analgesia ToolBox

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Disclosures: Dr Taverner

- Consultancy: Nevro
- Educational Talks: Nevro, Abbott, Boston Scientific, Mundipharma
- Research: Abbott, Medtronic, Spinethera, BrixtonBio
- Conflicts: nil this talk

Disclosures: Dr Gupta

- Consultancy: Nil
- Educational Talks: nil
- Research: Spinethera, BrixtonBio
- Conflicts: nil this talk

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Learning Objectives

- Show scrambler therapy in practice.
- How it differs from other non-invasive electrostimulation?
- Indications and contraindications.
- Literature Review
- 2-year outcomes at Frankston Pain Management
- Future work

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Introduction

Transcutaneous Electrical Nerve Stimulation (TENS)

- Small Portable, battery-operated device
- Delivers topical low-level electrical currents via electrodes placed on the pain site
- Based on the 'GateControl Theory' a-beta stimulation blocking c-fibre stimulation
- Trigger the release of endorphins
- Non-invasive, drug-free , Few side effects
- Reduce reliance on pain medication

Scrambler Therapy

- Large mains powered device
- Non-invasive neuromodulation electro-analgesia treatment
- Very low transcutaneous electric current via surface electrodes placed around painful site
- Aiming to "scramble" pain signals by replacing them with "synthetic non-pain" c-fibre stimulation.
- Resets brain's perception/interpretation of pain
- "Control-Alt-Delete" on chronic pain circuits.
- Reduce pain, medication and improves function

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Scrambler Therapy

Retrains the brain with 'dermatomal sandwiches' of "synthetic non-pain" information produced by up to 5 artificial paired neurons that is transmitted by cutaneous C fibre receptors to the central nervous system.

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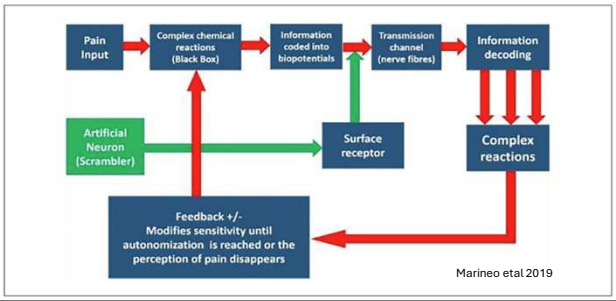
Simplified Model of Scrambler Therapy



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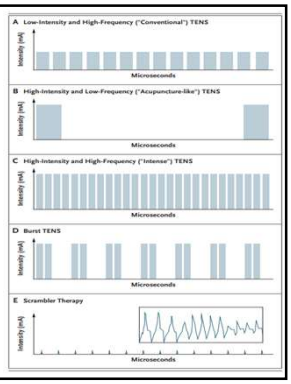
Scrambler Stimulation

16 types of signals like normal action potentials

- Frequency from 43 to 52 Hz
- Current of 3.5 to 5.5mA
- Voltage of 6.5 to 12.5V
- 7 to 11 microseconds

Grouped in trains of 4 similar but different waveforms that are constantly varied by a proprietary algorithm.[1,2]

Smith TJ, 2023, Marineo etal 2012



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Treatment Session Goals

Initial Treatment

- Eliminate pain during a 30-45 minute treatment session
  - Adjust power setting (amplitude)
  - Adjust number of electrode pairs and placement of electrode pairs
- Usually offer a 'tryout'
- Long-lasting analgesia comes from a series of consecutive ~10 (range 2-20) treatment sessions over 2-weeks (range 2-28days), that reduces pain intensity and increase duration of pain relief

Booster sessions are provided as needed

- To maintain pain relief
- 1-4 boosters over 1-4 days

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Indications for Use

- Chronic ketamine/opioid-refractory pain
- Chronic neuropathic pain
- Chronic nociplastic pain
- Chronic oncologic pain
- Complex Regional Pain Syndrome*
- Pancreas and abdominal cancer pain
- Post-herpetic pain (shingles pain)
- Bone metastases
- Spinal cord stenosis
- Persistent Spinal Pain Syndromes*
- Sciatic and Lumbar Pain
- Post surgical syndromes
- Brachial Plexus Neuropathy
- Chemotherapy-induced Peripheral Neuropathy (CIPN)
- Endometriosis
- Fibromyalgia

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Contra-Indications

- Pacemaker or other implantable devices (excluding total joint implants or spinal instrumentation)
- Vena Cava, aneurysm clips, coronary or other vascular stents
- Pregnancy
- History of epilepsy, brain damage, symptomatic brain metastases
- Prior coeliac plexus block or other neurolytic pain control treatment, within 4 weeks
- Wounds or skin irritation in areas where the electrodes are required to be placed
- Cardiac ischemia within the previous 6 months

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Benefits of Scrambler Therapy

- Opioid-Sparing: reduces reliance on pharmacological treatments.
- Improved functional outcomes,
- Improved well-being in patients with neuropathic and many other persistent pain.
- No serious adverse events

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Literature review

There are 7 RCTs and 79 papers at 2/10/2025.

(List available on request.)

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Cutaneous Electroanalgesia for Relief of Chronic and Neuropathic Pain
Smith TJ, Wang EJ, Loprinzi CL. NEJM July 2023

- Scrambler Therapy can provide **substantial and often permanent relief** for **80–90% of chronic pain patients**, including those with chemotherapy-induced peripheral neuropathy, fibromyalgia, and nerve pain.
- Compared to TENS , Scrambler Therapy showed **greater durability of pain relief**, with effects often lasting beyond the treatment sessions.
- Targets **damaged nerve pathways** and retrains the brain to interpret pain signals differently.
- Benefits include:
  - **Reduced reliance on opioids**
  - **Minimal side effects**
  - **Potential for long-term remission of pain**
  - Best results seen in **neuropathic and treatment-resistant chronic pain**.
  - Not suitable for **acute injuries**, **mechanical back pain**, or **pain from active malignancies**.

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Pain Medicine, 24(3), 2023, 325–340
https://doi.org/10.1093/pm/pnac137
Advance Access Publication Date: 7 September 2022
Review Article

Safety of Scrambler Therapy: A Systematic Review of Complications and Adverse Effects

Eric J. Wang, MD,* Gerard Limerick, MD, PhD,† Ryan S. D'Souza, MD,‡ Katie Lobner, MLIS,§ Kayode A. Williams, MD,* Steven P. Cohen, MD,*,†,¶,‖ and Thomas J. Smith, MD‡

- **Sample size**: *1,152 patients* across 6 randomized controlled trials (RCTs), 19 open-label trials, and 11 case series/reports.
- **Complication rate**: Only *3 out of 1,152 patients* experienced minor side effects:
  - 2 cases of **contact dermatitis**
  - 1 case of **minor ecchymosis** (bruising), which resolved without intervention
- **No serious adverse events** were reported.
- The review concluded that Scrambler Therapy is **significantly safer** than invasive neuromodulation devices like spinal cord stimulators.
- Registered with **PROSPERO** for transparency and reproducibility.

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Scrambler therapy may relieve chronic neuropathic pain more effectively than guideline-based drug management: results of a pilot, randomized, controlled trial.

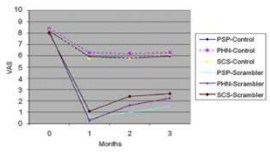

Fig. 3. Effect of treatment by type of pain.

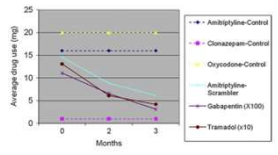

Fig. 6. Effect of treatment on pain medication use.

52 patients with postsurgical, PHN, Spinal Canal Stenosis pain
26 randomised to guideline MMM and 26 to scrambler therapy

Marineo G, Iorno V, Gandini C, Moschini V, Smith TJ. Journal of pain and symptom management. 2012;43(1):87-95

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Scrambler therapy technology device MC-5A

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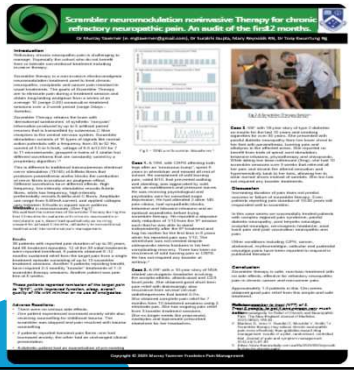

12 Month Outcomes Presented at NSANZ ASM 2025

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Frankston Pain Management

2-year Outcomes

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Baseline Demographics

	ALL Initial Tx	No Changer EOT p7+/10	Partial Responders EOT p3-6/10	Short Remitter EOT p<2/10	Long Responder EOT p<2/10
n	78	17(21%)	9 (12%)	25 (32%)	27 (35%)
Age	48.9 (14-89)	55.5 (29-89)	53.3 (29-75)	57.6 (16-85)	51.4 (14-80)
Gender	45M, 31F	M10, F7	4M, 5F	17M, 8F	13M, 14F
Baseline Pain	7.1	7.2	7.6	6.9	6.9
Av oMEDD	24.1	18.9	23.9	20.4	17.7
oMEDD = 0	44	12	4	10	18

Outcomes collected prospectively on consecutive patients treated at Frankston Pain Management

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Funding Status

Funding	ALL Initial Tx	No Changer	Partial Responders	Short Remitter	Long Responder
n	78	17	9	25	27
Self-Funded	59	12	8	22	19
WorkSafe	5	4	0	0	1
DVA	3	0	1	0	2
TAC	5	1	0	1	3
Private Extras @50%	2	0	0	0	2
Probono	2	0	0	2	0

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End of Treatment Pain scores and Patient GPE

Pain T0 v Pain EOT	ALL Initial Tx	No Changer	Partial Responders	Short Remitter	Long Responder
n	78	17	9	25	27
Av Tx /person	8.1	7.1	7.7	7.4	9.8
Pain T0, T eot, △	7.1, 2.8, △=4.3↓	7.2, 7.5, △=0.3↑	7.6, 4.4, △=3.2↓*	6.9, 0.9, △=6.0↓**	6.9, 0.8, △=6.1↓***
VMB	14	0	0	1	8
MB	9	0	0	4	11
Better	7	2	4	9	8
Nil	44	12	5	11	0
Worse	3	3	0	0	0

NTT = treat 3 people, get 1 long responders *p<0.0001, **p<0.0001, ***p<0.0001

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Baseline v 3 month OMEDDs

oMEDD	ALL Initial Tx	No Changer	Partial Responders	Short Remitter	Long Responder
n	78	17	9	25	27
nil	44 → 49	12 → 12	4 → 5	14 → 13	17 → 20
1-10mg	5 → 4	0 → 0	0 → 0	4 → 2	1 → 2
11-40mg	9 → 9	0 → 0	1 → 2	5 → 5	3 → 3
41-99mg	16 → 12	5 → 5	3 → 1	3 → 4	6 → 2
>100mg	3 → 2	0 → 0	1 → 1	2 → 1	0 → 0
Average	24.1 → 21.5	18.9 → 18.9	23.9 → 15.6*	25.4 → 23.1	17.3 → 7.9**

*p=0.1 ns **P=0.017

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Patient GPE at 3 month follow up

GPE @3m	ALL Initial Tx	No Changer	Partial Responders	Short Remitter	Long Responder
n	77	17	9	25	27
Very Much Better	8	0	0	0	9
Much Better	11	0	0	0	11
Better	8	0	0	0	7
No Change	44	17	9	25	0
Worse	0	0	0	0	0

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Booster Treatments

- 15 patients in this cohort had 1 or more Boosters (1-20 episodes)
  - 2 patients have had boosters outside this data window
- 98% response to booster treatment
  - 1 Short Remitter obtained no benefit from a booster treatment
- 2 week to 6 month interval between booster treatments
  - The 6 Long responders at 12m still haven't required a booster treatment
  - Another 6 people in 2nd 12 months haven't needed a booster
    - Some now approaching 3 years with sustained relief

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Painful conditions

Responders
- Abdominal/Pelvic pain
- Cancer (painful Mets, CIPN)
- Cervical & lumbosacral PSPS
- Cervicogenic Headache
- CRPS
- Peripheral neuropathy (CIPN)
- Post surgical
- Phantom
- Post herpetic neuralgia
- Multisite/Widespread

Non Responders
- Abdominal Pain
- Cervical & lumbosacral PSPS
- CRPS
- Mixed MSK – eg rotator cuff tear
- Peripheral neuropathy
- Post herpetic neuralgia
- Post surgical pain
- Spinal cord injury (i/t methotrexate)
- Unstable mental health

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Scrambler and CRPS

Responder
- Av Age 35.8
- Gender: M4, F4
- N=8,
  - Pre-Post pain score (x/10)
    - T0 5.9, Teot 0, △5.9↓ **p<0.0001
  - 8 improvement >3months
    - 3 Better
    - 4 Much better
    - 1 Very much better

Non Responder
- Av Age: 42.4
- Gender: M6, F3
- N=9
  - Pre-Post pain score (x/10)
    - T0 8.0, Teot 5.6, △2.4↓ *p<0.03
  - 9 No change at >3 months

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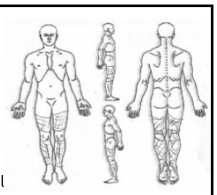
CRPS Case story. 19M



- Cold burning pain rated 7-8/10 last 9 years.
- Unable to stand, walk after innocuous bump.
  - Aggravated by wind, pressure waves, air conditioners etc
- Wheelchair for 9 years – missed all secondary school
- Extensive psychological and psychiatric care for co-morbid depression.
  - Attended 3 other MD pain clinics. No response to meds, blocks, infusions etc
- Scrambler: 1/10 daily reduction from 3rd day, stood independently after 8th treatment to hug mother for first time in 9 years when pain 1/10.
- Stopped using wheelchair, despite osteoporotic stress fractures both feet!
- No boosters, recurrence or analgesics at nearly 3 years.

More info: https://thenewdaily.com.au/life/2023/08/04/possible-cure-for-chronic-pain/

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Scrambler and Cervicogenic Headache

Responder
- Av Age 57.2
- Gender: M4, F4
- N=8,
  - Pre-Post pain score (x/10)
    - T0 7.7, Teot 0.7, △7.0↓ **p<0.0001
  - improvement >3m
    - 0 no change
    - 1 Better
    - 3 Much better
    - 4 Very much better

Non Responder
- Av Age: 58.8
- Gender: M2, F2
- N=4
  - Pre-Post pain score (x/10)
    - T0 7.5, Teot 2.8, △3.7↓ p<0.07 ns
  - 4 No change at >3 months

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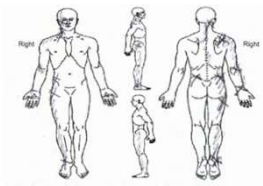
Case 2 – Cervicogenic Headache

- 29F, cervicogenic HA from MVA 10 year earlier
  - Bilateral C0/1, C1/2 and C2/3 joints involved
  - Right arm and low back and right leg pain
- Cervical MBB x2, 2018
- C2DRG & TON PRF, 2018, 2020, (1-9m)
- Added C0/1 2021, 2022 and 2023 (3-7m)
  - Only helped neck and headache
- Scrambler x10, 11/2023 7m complete relief!
- Booster x3, 6/2024, 15m pain relief,
  - 1st analgesia recorded 1/10/25 on safescript.
- Ceased propranolol, rizatriptan and topiramate



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Limitations

- Potential placebo effects
- Small sample
- Single centre
- Heterogenous population
- Open label, non randomised
- DBRCT – not possible

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Future

- Could response to scrambler be used to predict invasive Tx
- How to convert short remitters into long responders
- Impact pain phenotype of responders and non responders
- Impact Concomitant Medication and Comorbid Conditions
- Stay tuned for 3-year data.
- Multisite Comparative RCT more useful than sham/placebo study
- Multicentre Australia-wide clinical trial? (please chat with us)

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Conclusion

- Treat 3 people, 1 long response (NTT 3)
- Booster treatments restore pain relief for 98% responders
- “Win don’t lose outpatient non-invasive treatment”
- So even if it is a placebo, I want it super sized!
- It is another tool for the pain management toolbox

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Team Acknowledgement

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- Dr Surabhi Gupta
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Questions?

More Information

- [redacted]
- [redacted]

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