

Introduction

Approximately 10% of the United States population suffers from chronic neuropathic pain (NP), which includes conditions like failed back surgery syndrome, complex regional pain syndrome, and diabetic neuropathy.¹ When treatment options are exhausted, spinal cord stimulators (SCS) offer a minimally invasive solution by delivering electrical currents to the dorsal column to reduce pain.² This study aims to evaluate patient-reported outcomes status post three years after SCS implantation to understand the long-term effectiveness in managing NP.

Materials and Methods

- Design:** Retrospective study reviewed by WCG IRB; deemed exempt under 45 CFR 46.104(d)(2).
- Population:** Patients who underwent SCS implantation at Kansas Pain Management (July 2021–June 2022).
- Data Collection:** Telephone interviews with verbal informed consent documented by checklist; followed by chart review.
- Variables Assessed:** Pain reduction, current pain (0–10), SCS use, medication frequency/dosage, adjuvant therapies, follow-up (6 mos–3 yr), and complications.
- Analysis:** 33 of 74 eligible patients completed interviews; data analyzed in SPSS comparing responders (≥50% relief) vs non-responders (<50%).

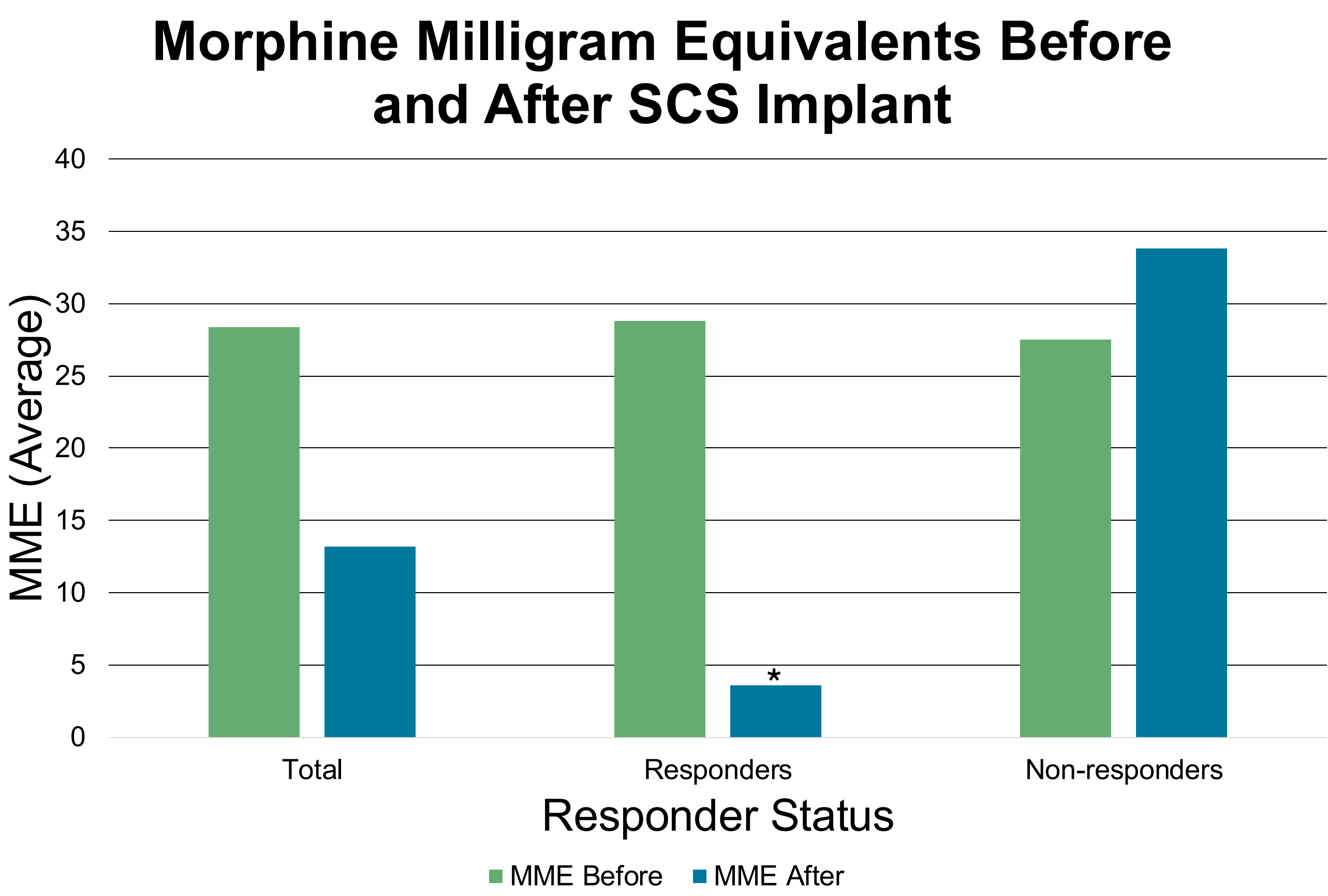


Figure 1. Morphine Milligram Equivalents Before and After SCS Implant were calculated for responders and non-responders to evaluate trends in opioid consumption. Although reporting similar MME before SCS implant, responders significantly decreased their MME with many discontinuing opioid usage completely.

Table 1. Average Pain Reduction and Spinal Cord Stimulator-Related Complications

	Total (N=33)	Responders (n=20)	Non-responders (n=13)
Pain Reduction (%)	48.4	73.5 *	9.9 *
Pain Before SCS (0-10)	8.14	8.2	8.03
Pain After SCS (0-10)	4.3	2.9 *	6.4 *
Change in Pain (%)	46.5	63.3 *	20.6 *
Explant n (%)	3 (9.1)	0 (0)	3 (23.1)
Lead Migrations n (%)	7 (21.2)	3 (15)	4 (30.8)
Procedures After SCS n (%)	12 (36.4)	4 (20)	8 (61.5) *
6-months follow up n (%)	27 (81.8)	19 (95) *	8 (61.5) *
1-year follow up n (%)	18 (54.5)	10 (50)	8 (61.5)
2-year follow up n (%)	14 (42.4)	10 (50)	4 (30.8)
3-year follow up n (%)	12 (36.4)	9 (45)	3 (23.1)

*p-value <0.05

Results

- Cohort:** 33 patients (20 responders, 13 non-responders); mean age 61.6 years (48% female) with no baseline differences in age ($p = .315$) or gender ($p = 1.0$).
- Pain and Opioid Outcomes:** Responders achieved greater pain reduction (**73.5% vs 9.9%**, $p < .001$), lower current pain scores (**2.9 vs 6.4**, $p = .0049$), and significantly decreased opioid use ($p < .001$) with lower post-implant MME (**3.6 vs 33.75**, $p = .002$).
- Procedures and Complications:** Responders required significantly fewer additional procedures including radiofrequency ablation post-SCS ($p = .027$) and had lower rates of lead migration/explant (**15% vs 30.8%**, $p = .279$) although not significant.
- Follow-up:** Six-month attendance was significantly higher in responders (**95% vs 61.5%**, $p = .015$), with no significant differences at 1–3 years.
- Overall:** Responders demonstrated sustained long-term benefits, including **greater pain relief, lower opioid use, and fewer complications** compared to non-responders.

Discussion

Findings revealed that responders experienced sustained pain relief, reduced opioid use, and fewer procedures three years post-SCS implantation. Six-month follow-up was significantly higher among responders, suggesting that early post-operative engagement may support long-term outcomes. While findings support SCS as an effective strategy for managing NP, differences in lead migration and explant rates were not statistically significant, likely due to the small sample size. This limitation affects generalizability and warrants further investigation.

References

1. DiBonaventura MD, Sadosky A, Concialdi K, et al. The prevalence of probable neuropathic pain in the US: Results from a multimodal general-population health survey. J Pain Res. 2017;10:2525-2538. doi:10.2147/JPR.S127014,

2. Chakravarthy K, Richter H, Christo PJ, Williams K, Guan Y. Spinal Cord Stimulation for Treating Chronic Pain: Reviewing Preclinical and Clinical Data on Paresthesia-Free High-Frequency Therapy. Neuromodulation. 2018;21(1):10-18. doi:10.1111/NER.12721,