Perioperative management of spinal cord stimulators in patients undergoing non-SCS spine surgery: a retrospective cohort

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Why this matters

Spinal cord stimulator (SCS) use is rising, so more implanted patients now undergo unrelated spine surgery. The operative field sits near leads, anchors, and the generator, and electrocautery can damage or inactivate the system. Guidance and manufacturer manuals recommend preop deactivation or surgery mode, bipolar electrocautery, careful return-pad placement, and postop reactivation. How often any of this is actually documented was unknown.

Methods

Single-center retrospective cohort. Adults with a previously implanted SCS who underwent non-SCS spine surgery, Apr 2016 – Mar 2026. The surgical case was the unit of analysis. Trained reviewers abstracted records with a structured instrument; the senior author adjudicated discrepancies. Proportions are reported with Wilson 95% confidence intervals (CI).

Approved by the Mass General Brigham (MGB) IRB (2025P003416) with waiver of informed consent.

Cohort

1,182 surgical cases in 433 patients screened

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70 non-SCS spine surgery cases in 56 patients

12 cases excluded:
SCS implant not confirmed (n=4)
SCS revision or removal (n=3)
Insufficient follow-up (n=3)
Non-SCS neurostimulator (n=2)

↓

58 cases in 46 patients analyzed

38 patients contributed 1 surgery; 8 contributed more than one.

Only 2 of 58 spine surgeries in SCS patients documented 2 important safety steps:

★ 1 · PRE-OPERATIVE
Device deactivation or placement in surgery mode

★ 2 · INTRA-OPERATIVE
Electrocautery current routing away from the generator

Alignment with perioperative recommendations

RECOMMENDATION	N/N (%)	95% CI
PRE-OPERATIVE		
Pain service or implanting physician consultation	5/58 (8.6%)	3.7–18.6
Perioperative management plan documented	21/58 (36.2%)	25.1–49.1
★ Device deactivation or surgery mode (Element 1)	**8/58 (13.8%)**	**7.2–24.9**
INTRA-OPERATIVE		
★ Appropriate electrocautery management (Element 2)	**25/58 (43.1%)**	**31.2–55.9**
POST-OPERATIVE		
Device reactivation before discharge	11/58 (19.0%)	10.9–30.9
Pain service consultation before discharge	7/58 (12.1%)	6.0–22.9
Aligned with both Elements 1 and 2	**2/58 (3.4%)**	**1.0–11.7**

ADVERSE EVENTS

Device-related adverse events occurred in 5 cases (8.6%; 95% CI, 3.7–18.6). One was mechanistically linked to perioperative management: generator damage after monopolar electrocautery with an undocumented return-pad location.

What would fix this

- ✓ A preop checklist item that names the device and the plan
- ✓ Documented return-pad position relative to the generator
- ✓ A defined owner for reactivation before discharge

Limitations

These measures reflect what was documented. Care may have been delivered without a corresponding note, so these rates are a floor for practice and a direct measure of documentation. Single center, spine surgery only.

Cohort at a glance

Cases	**58**
Mean age, y	**59.2 (SD 13.8)**
Male	**30 (51.7%)**
ASA III	**39 (67.2%)**
Elective	**56 (96.6%)**
Instrumented fusion	**42 (72.4%)**

All general anesthesia; electrocautery used in every case.

Read the full paper

Saleh AR, Standage E, Luansritisakul C, Jin E, Smith MR, Hao D. Perioperative management of spinal cord stimulators in patients undergoing non-SCS spine surgery: A retrospective cohort study. Interv Pain Med. 2026;5:100823.

The authors declare no competing interests.