Electrocautery Safety in Cochlear Implant Patients: Examining Surgeon Awareness and Practice Patterns

Adithya Sreenivas[1], Jeffrey Toman[1], Anita Jeyakumar, MD, FACS, FAAP [1,2]

1. Northeast Ohio Medical University, Rootstown, OH, 44272
2. HEARS, Akron OH, USA, 44319

Introduction

- Cochlear implants (CIs) are increasingly used to restore hearing in patients with severe-to-profound sensorineural hearing loss, making it more likely that surgeons across multiple specialties will encounter CI recipients undergoing unrelated surgical procedures.
- Electrocautery is routinely used for tissue dissection and hemostasis during surgery. Current cochlear implant manufacturer recommendations advise against monopolar electrocautery because of the theoretical risk of electrical or thermal injury to the implant or surrounding cochlear structures, while bipolar electrocautery may be used with appropriate precautions.
- Although manufacturer recommendations remain conservative, experimental and limited clinical studies have reported no detectable cochlear implant malfunction following monopolar electrocautery under controlled conditions, highlighting uncertainty regarding current perioperative practices.
- Despite existing recommendations and evolving evidence, little is known about surgeons' awareness of electrocautery-related precautions, formal education on this topic, or how this knowledge influences operative practice.
- **Purpose:** To evaluate surgeons' knowledge, beliefs, and self-reported electrocautery practices in patients with cochlear implants and identify factors associated with awareness of electrocautery-related device risks.

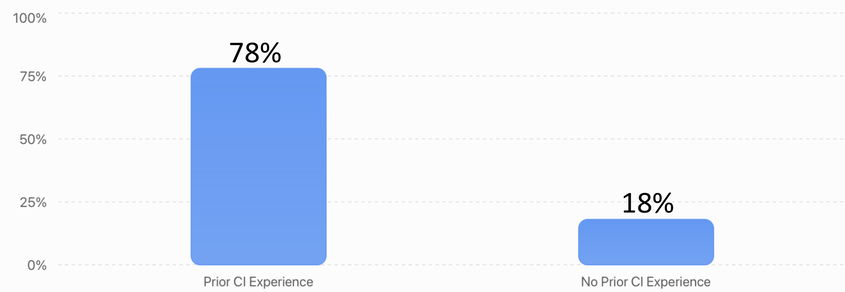
Methods

- **Study Design:** Cross-sectional anonymous survey study conducted from September–December 2025 among practicing surgeons identified through the Northeast Ohio Medical University surgery alumni database and invited via email to complete a one-time Qualtrics survey
- **Survey Variables:** Practice setting, years in practice, surgical volume, electrocautery use, and prior cochlear implant experience
- **Outcomes:** Awareness of electrocautery-related cochlear implant risks, familiarity with safety precautions, and prior formal education
- **Statistical Analysis:** Descriptive statistics and exploratory subgroup comparisons were performed using Fisher's exact test ($p < 0.05$)

Results

Figure 1. Awareness of Monopolar Electrocautery-Related Device Risks by Prior Cochlear Implant Surgical Experience

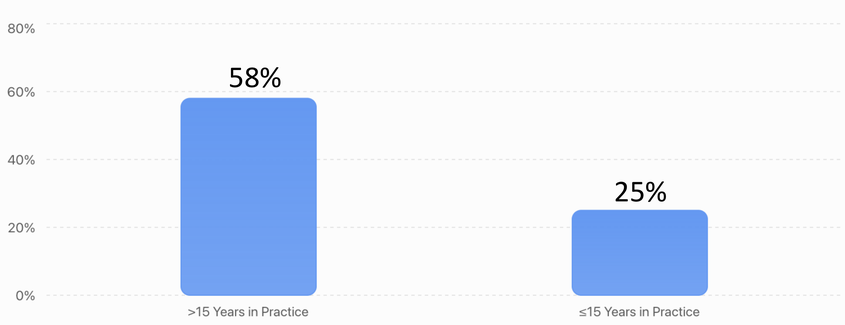
Surgeons with prior cochlear implant surgical experience demonstrated significantly greater awareness of electrocautery-related device risks.



Prior CI Experience (n = 9) • No Prior CI Experience (n = 11) • Fisher's exact test: p = 0.002

Figure 2. Awareness of Monopolar Electrocautery-Related Device Risks by Years in Practice

Surgeons with more than 15 years in practice demonstrated greater awareness of electrocautery-related device risks.



>15 Years in Practice (n = 12) • ≤15 Years in Practice (n = 8) • Fisher's exact test: p = 0.041

Results Cont.

•Twenty practicing surgeons completed the survey; 95% (19/20) practiced in urban or suburban settings.

•Electrocautery was used in at least 75% of surgical cases by 80% (16/20) of respondents.

•Overall, 45% (9/20) reported awareness of monopolar electrocautery-related cochlear implant risks.

•Only 15% (3/20) reported receiving prior formal education regarding electrocautery precautions in cochlear implant patients.

•Fifty-eight percent (11/19) reported no modification of surgical technique when operating on patients with cochlear implants.

Discussion & Conclusion

- Awareness of electrocautery-related cochlear implant risks was variable among practicing surgeons despite routine electrocautery use and existing manufacturer recommendations.
- Surgeons with prior cochlear implant surgical experience and those with more than 15 years in practice demonstrated significantly greater awareness of device-related risks, suggesting that experience contributes to knowledge of perioperative precautions.
- Most respondents reported no prior formal education regarding electrocautery precautions and no modification of surgical technique when operating on patients with cochlear implants, highlighting important opportunities for targeted educational initiatives.
- Improving awareness of device-specific electrocautery precautions may enhance perioperative safety and promote evidence-based surgical decision-making in patients with cochlear implants.
- Larger, multi-institutional studies are warranted to further characterize surgeon knowledge and practice patterns and to guide future educational efforts and clinical recommendations.

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