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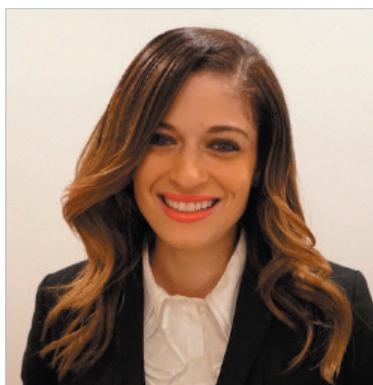
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APSF Awards 2023 Grant Recipients

by Yan Xiao, PhD

The APSF grant program supports and advances anesthesia patient safety culture, knowledge, and learning, a part of the APSF mission. The program has played an essential role in establishing and enhancing careers of many professionals conducting safety research and education. Since 1987, the APSF has supported more than 130 anesthesia professionals with more than \$14 million in funding.

The 2022–23 APSF investigator-initiated grant program received 30 letters of intent (LOI) from 17 organizations in the United States and Canada. The Scientific Evaluation Committee evaluated and scored these letters, with the assistance of external statistical reviewers. The LOIs receiving the five highest scores were invited to submit full proposals. Four full proposals were received and were discussed via a hybrid meeting of the Scientific Evaluation Committee on October 22, 2022. Two proposals were recommended for funding to the APSF Executive Committee and Board of Directors, and both received unanimous support. This year's recipients are Annery Garcia-Marcinkiewicz, MD, MSCE, from Children's Hospital of Philadelphia and Peter Schulman, MD, from Oregon Health & Science University. They provided the following description of their proposed work:



**Annery Garcia-Marcinkiewicz,
MD, MSCE**

Assistant Professor of Anesthesiology and Critical Care, Children's Hospital of Philadelphia

Dr. Garcia-Marcinkiewicz's project is entitled **"Nasotracheal Intubation with Videolaryngoscopy versus Direct Laryngoscopy in Infants (NasoVISI) Trial"**

Background: More than 32,000 infants undergo congenital heart surgery in the United States annually,¹ with approximately 50% of these patients requiring nasotracheal intubation (NTI). Direct laryngoscopy (DL) is the current standard of care for initial NTI attempts in these patients. Small infants are particularly vulnerable during tracheal intubation because of their rapid rate of oxygen desaturation. Securing the tracheal tube quickly and on the first attempt is the best practice to minimize complications. Our team established a multicenter registry to improve the quality of airway management in children with challenging airways and discovered that multiple tracheal intubation attempts are a key risk factor for severe adverse events such as cardiac arrest, laryngospasm, and severe hypoxemia.² Additionally, our most recent multicenter trial comparing videolaryngoscopy (VL) to DL in infants found that VL improves first attempt success rate and reduces severe complications when used for orotracheal intubation in infants with normal airways.³ Infants presenting for cardiac surgery are a particularly vulnerable group who often require NTI. The short apnea tolerance time in such infants, particularly those with cardiovascular anomalies, creates a critical time-pressure to intubate. NTI with DL is the most common clinical practice in infants presenting for cardiac surgery, but often requires additional maneuvers such as the use of Magill forceps or external laryngeal manipulation, all of which can contribute to prolonged intubation time and complications. With DL, the supervising clinician is blind to what the trainee sees, which makes effective guidance and instrumentation difficult. Observational studies in adults suggest that the use of VL can provide higher NTI success rates and shorter intubation time compared to DL.⁴ VL improves trainee coaching during tracheal intubation, and the shared view reassures the supervising clinician that the tracheal tube is being placed properly.⁵ This is highly desirable in vulnerable cardiac infants. There is currently no published data on whether VL is more effective than DL at improving first-attempt NTI success rates and reducing complications in infants undergoing cardiac surgery. We hypothesize that reducing multiple attempts will enhance the safety of NTI in this vulnerable population.

Aims: This proposal seeks to reduce complications by reducing the number of NTI attempts in infants presenting for cardiothoracic proce-

dures. We hypothesize that VL as the first attempted approach will be associated with an increased first-attempt success rate, a reduced number of tracheal intubation attempts, and reduced tracheal intubation-related complications, specifically intubation-associated hypoxemia. Reducing the number of attempts will enhance the safety of airway management in infants presenting for cardiac procedures and is well aligned with the mission of the Anesthesia Patient Safety Foundation.

Implications: Tracheal intubation is a high-risk procedure in infants because of their unique anatomy, high oxygen consumption, and smaller edema-prone airways all leading to very limited apnea tolerance. Hypoxemia and multiple attempts are important targets to enhance safety. Infants with cardiovascular anomalies are an extremely high-risk group due to their very limited physiologic reserves. Our proposed project will potentially lead to the reduction of multiple NTI attempts, consequent hypoxemia, and associated complications in these vulnerable infants.

REFERENCES

1. The Society of Thoracic Surgeons. Congenital Heart Surgery Database, table 7 neo infant. <https://www.sts.org/registries-research-center/sts-national-database/congenital-heart-surgery-database>. Published 2020. Accessed February 17, 2022.
2. Fadjoe JE, Nishisaki A, Jagannathan N, et al. Airway management complications in children with difficult tracheal intubation from the Pediatric Difficult Intubation (PeDI) registry: a prospective cohort analysis. *Lancet Respir Med*. 2016;4:37–48. PMID: [26705976](https://pubmed.ncbi.nlm.nih.gov/26705976/).
3. Garcia-Marcinkiewicz AG, Kovatsis PG, Hunyady AI, et al. First-attempt success rate of video laryngoscopy in small infants (VISI): a multicentre, randomised controlled trial. *Lancet*. 2020;396:1905–1913. PMID: [33308472](https://pubmed.ncbi.nlm.nih.gov/33308472/)
4. Jiang J, Ma DX, Li B, Wu AS, Xue FS. Videolaryngoscopy versus direct laryngoscopy for nasotracheal intubation: A systematic review and meta-analysis of randomised controlled trials. *J Clin Anesth*. 2019;52:6–16. PMID: [30153543](https://pubmed.ncbi.nlm.nih.gov/30153543/)
5. Volz S, Stevens TP, Dadiz R. A randomized controlled trial: does coaching using video during direct laryngoscopy improve residents' success in neonatal intubations? *J Perinatol*. 2018;38:1074–1080. PMID: [29795452](https://pubmed.ncbi.nlm.nih.gov/29795452/)

Funding: \$149,119 (January 1, 2023–December 31, 2024). The grant was designated as the APSF/American Society of Anesthesiologists (ASA) President's Research Award.

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APSF 2023 Grant Recipients (Cont'd)

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Peter Schulman, MD

Professor of Anesthesiology, Oregon Health and Science University

Dr. Schulman's project is entitled “**Electromagnetic Interference with an Underbody Dispersive Electrode in Patients with Implantable Cardioverter Defibrillators Undergoing Surgery.**”

Background: During a surgical procedure, the function of a cardiac implantable electronic device (CIED) may be disrupted by electromagnetic interference (EMI).¹ The consequences of EMI include hemodynamically significant bradycardia or asystole in the pacing-dependent patient, inappropriate shocks or antitachycardia pacing, direct damage to the CIED, and other less common, but clinically significant sequelae.¹ Failure to prevent or mitigate these effects might lead to patient injury and increased mortality.² Intraoperative EMI most often results from the use of monopolar electrosurgery (i.e., “cautery”). Monopolar electrosurgery requires a dispersive electrode to complete the electrical circuit. While a conventional dispersive electrode is applied directly to the patient's skin, an alternative “underbody” dispersive electrode is now being used with increasing frequency that is incorporated into a gel pad and placed

directly on the operating table.³ Because the surface area of the underbody electrode is substantially larger than a conventional electrode, some reports suggest that the use of an underbody dispersive electrode might be associated with an increased risk of EMI, but conclusive evidence is lacking.^{3,4} As the use of underbody electrodes becomes more ubiquitous, it is imperative to better understand and quantify their associated risks for patients with CIEDs undergoing surgery.

Aims: This study will evaluate the risks of underbody dispersive electrode use in patients with implantable cardioverter defibrillators (ICDs) undergoing noncardiac surgery. Specifically, we will determine the risk of any EMI, and the risk of clinically meaningful EMI, from monopolar electrosurgery with use of an underbody dispersive electrode for patients with ICDs undergoing noncardiac surgery superior or inferior to the umbilicus. We will then compare the results to data obtained from a prior study that we conducted⁵ to determine whether these risks are higher with an underbody dispersive electrode than with the use of an appropriately positioned conventional dispersive electrode.

Implications: A substantial number of patients with CIEDs undergo surgical procedures. Monopolar electrosurgery is required for most operations, and underbody dispersive electrode use is rapidly increasing. Determining the risk of EMI with underbody dispersive electrode use and comparing this risk to that of conventional dispersive electrode use will inform future practice recommendations, prevent adverse events, and improve perioperative care. If the risk of EMI is significantly higher with an underbody electrode, using a conventional, appropriately positioned dispersive electrode rather than an underbody electrode might obviate the need for CIED reprogramming in certain circumstances. Conversely, if the risk of EMI with an underbody electrode is not increased,

this information could be used to assuage concerns about underbody electrode use for patients with CIEDs and to bolster the case that CIED reprogramming is typically not needed for inferior to the umbilicus surgery.

REFERENCES

1. Practice advisory for the perioperative management of patients with cardiac implantable electronic devices: pacemakers and implantable cardioverter-defibrillators 2020: an updated report by the American Society of Anesthesiologists Task Force on perioperative management of patients with cardiac implantable electronic devices. *Anesthesiology*. 2020;132:225–252. PMID: [32032098](#).
2. Rozner MA, Kahl EA, Schulman PM. Inappropriate implantable cardioverter-defibrillator therapy during surgery: an important and preventable complication. *J Cardiothorac Vasc Anesth*. 2017;31:1037–1041. PMID: [28216202](#).
3. Tully BW, Gerstein NS, Schulman PM. Electromagnetic interference with an underbody dispersive electrode in a patient with an implantable cardioverter-defibrillator undergoing noncardiac surgery: a case report. *A A Pract*. 2020;14:e01285. PMID: [32985854](#).
4. Singleton MJ, Fernando RJ, Bhavne P, et al. Inappropriate implantable cardioverter-defibrillator therapy with the use of an underbody electrosurgery dispersive electrode. *J Cardiothorac Vasc Anesth*. 2021. PMID: [33745836](#).
5. Schulman PM, Treggiari MM, Yanez ND, et al. Electromagnetic interference with protocolized electrosurgery dispersive electrode positioning in patients with implantable cardioverter defibrillators. *Anesthesiology*. 2019;130:530–540. PMID: [30601218](#).

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Yan Xiao, PhD, is a professor at the University of Texas at Arlington College of Nursing and Health Innovation. He is also the chair of the APSF Scientific Evaluation Committee.

The author has no conflicts of interest.
