



## Thomas Anthony ("Tony") Anderson

Clinical Professor, Anesthesiology, Perioperative and Pain Medicine

### CLINICAL OFFICE (PRIMARY)

- **Anesthesia Department**

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### ACADEMIC CONTACT INFORMATION

- **Administrative Contact**

Joyce Tseng - Administrative Associate

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## Bio

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### CLINICAL FOCUS

- Acute Pain Management
- Regional Anesthesia
- Chronic Post-Surgical Pain
- Pediatric Anesthesia

### ACADEMIC APPOINTMENTS

- Clinical Professor, Anesthesiology, Perioperative and Pain Medicine
- Member, Maternal & Child Health Research Institute (MCHRI)
- Member, Wu Tsai Neurosciences Institute

### BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Associate Editor, Anesthesiology (2025 - present)
- Scientific Advisory Board, Association of University Anesthesiologists (2020 - present)
- Associate Editor, Anesthesia & Analgesia (2019 - present)
- Abstract Review Subcommittee on Regional Anesthesia and Acute Pain, American Society of Anesthesiologists (2018 - present)
- Educational Advisory Board, Association of University Anesthesiologists (2016 - 2019)
- Active Member, Association of University Anesthesiologists (2015 - present)
- Member, International Anesthesia Research Society (2015 - present)
- Member, Society for Pediatric Anesthesia (2008 - present)
- Member, American Society of Anesthesiologists (2005 - present)

### PROFESSIONAL EDUCATION

- Board Certification: Pediatric Anesthesia, American Board of Anesthesiology (2015)

- Board Certification: Anesthesia, American Board of Anesthesiology (2013)
- Fellowship: Boston Children's Hospital (2011) MA
- Residency: UCSF Anesthesiology Residency (2010) CA
- Internship, San Joaquin General Hospital , CA (2007)
- Medical Education: University of Michigan School of Medicine (2006) MI
- Ph.D., Massachusetts Institute of Technology , MA (2002)

## PATENTS

- Thomas Anderson. "United States Patent WO2015200712A1 Optical sensor for needle-tip tissue identification and diagnosis", Massachusetts Institute of Technology; Massachusetts General Hospital

## LINKS

- My lab website: <http://andersonlab.stanford.edu>

## Research & Scholarship

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### RESEARCH INTERESTS

- Adolescence
- Early Childhood
- Poverty and Inequality
- Race and Ethnicity

### CURRENT RESEARCH AND SCHOLARLY INTERESTS

#### 1. Acute and Chronic Pain Management: Focused Ultrasound for Peripheral Neuromodulation

Poorly controlled acute and chronic pain are common and significant sources of patient morbidity. Inadequate control of postoperative pain is a risk factor for worsened patient outcomes, and 5% to 80% of patients will develop chronic pain after surgery. Novel, safe, and effective methods to improve and prevent acute and chronic pain are needed. Focused ultrasound (FUS) can modulate central and peripheral nervous system structures. Most FUS research is concentrated on its utility for transcranial modulation of neural structures and ablation of tissues. However, there is evidence that it can also alter peripheral nerve conduction, including compound action potential depression in a manner similar to local anesthetics. However, no work has yet been published assessing its effects on acute or chronic pain, nor whether it is able to differentially modulate different classes of nerve fibers. We are interested in the potential of focused ultrasound to modulate peripheral nerves and improve both acute and chronic pain.

#### 2. Pediatric Perioperative Outcomes

Chronic pain and opioid use are major public health issues in the United States and internationally. Those who use opioids chronically and patients with chronic pain are more likely to have worsened health and require more medical care. Both adults and children who undergo surgery are at increased risk of prolonged opioid use after surgery and chronic post-surgical pain. While these issues have been well-studied in adult patients, far fewer studies exist in pediatric surgical populations. As more than six million inpatient and outpatient pediatric surgical procedures take place in the U.S. each year, it is imperative to understand the risk of prolonged opioid use and chronic pain after surgery in this vulnerable and understudied population and to design and investigate interventions to decrease these risks. We are working with several healthcare datasets assessing the risk of prolonged opioid use after surgery and chronic post-surgical pain in children. Our goal is to understand how various perioperative pain management strategies affect outcomes in children who undergo surgery. We are further interested in whether disparities exist in the perioperative pain management of children of different races, ethnicities, and socioeconomic status.

## Teaching

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### STANFORD ADVISEES

#### Postdoctoral Faculty Sponsor

Vladimir Gluhovic, Namrata Sangwan

### GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Pediatric Anesthesia (Fellowship Program)

## Publications

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### PUBLICATIONS

- **Focused ultrasound-induced inhibition of peripheral nerve fibers in an animal model of acute pain.** *Regional anesthesia and pain medicine*  
Anderson, T. A., Pacharinsak, C., Vilches-Moure, J., Kantarci, H., Zuchero, J. B., Butts-Pauly, K., Yeomans, D.  
2023
- **Association of Common Pediatric Surgeries with New Onset Chronic Pain in Patients 0-21 Years of Age in the United States.** *The journal of pain*  
Thapa, I., De Souza, E., Ward, A., Bambos, N., Anderson, T. A.  
2022
- **Low-dose intraoperative opioids and its association with PACU outcomes: a retrospective equivalence study**  
Anderson, T. A., De Souza, B., King, M. R.  
LIPPINCOTT WILLIAMS & WILKINS.2022: 829
- **Racial/Ethnic Variability in Use of General Anesthesia for Pediatric Magnetic Resonance Imaging**  
Anderson, T. A., Gan, Z., Rosenbloom, J. M., De Souza, B.  
LIPPINCOTT WILLIAMS & WILKINS.2022: 828
- **Health Care Burden Associated with Pediatric Prolonged Opioid Use After Surgery**  
Anderson, T. A., Joyner, A., King, M. R., Safranek, C., Parvathinathan, G., De Souza, B.  
LIPPINCOTT WILLIAMS & WILKINS.2022: 380
- **Visualizing Opioid-Use Variation in a Pediatric Perioperative Dashboard.** *Applied clinical informatics*  
Safranek, C. W., Feitzinger, L., Joyner, A. K., Woo, N., Smith, V., Souza, E. D., Vasilakis, C., Anderson, T. A., Fehr, J., Shin, A. Y., Scheinker, D., Wang, E., Xie, et al  
2022; 13 (2): 370-379
- **Dose-dependent effects of high intensity focused ultrasound on compound action potentials in an ex vivo rodent peripheral nerve model: comparison to local anesthetics.** *Regional anesthesia and pain medicine*  
Anderson, T. A., Delgado, J., Sun, S., Behzadian, N., Vilches-Moure, J., Szlavik, R. B., Butts-Pauly, K., Yeomans, D.  
1800
- **Laying the First Brick: A Foundation for Medical Investigation Through Big Data.** *Anesthesia and analgesia*  
Grant, M. C., Anderson, T. A.  
1800; 134 (1): 5-7
- **Prediction of Prolonged Opioid Use After Surgery in Adolescents: Insights From Machine Learning.** *Anesthesia and analgesia*  
Ward, A., Jani, T., De Souza, E., Scheinker, D., Bambos, N., Anderson, T. A.  
2021
- **Pediatric Anesthesia, an Issue of Anesthesiology Clinics, Volume 38-3.** *Anesthesia and analgesia*  
Anderson, T. A.  
2021; 132 (5): e68
- **Modeling Intraoperative Opioid Administration Variation: A Single-Center Retrospective Cohort Study of Children**  
Safranek, C., Poole, S., De Souza, B., Hong, T., Wang, E., Scheinker, D., Anderson, T. A.

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LIPPINCOTT WILLIAMS & WILKINS.2021: 795-797

- **Association between regional anesthesia and analgesic outcomes: a single-center retrospective study of 2,761 pediatric regional anesthetics**  
Xie, J. J., De Souza, B., Perez, F. D., Suarez-Nieto, M. V., Wang, E., Anderson, T. A.  
LIPPINCOTT WILLIAMS & WILKINS.2021: 934-936
- **Publication misrepresentation amongst pediatric anesthesiology fellowship applicants: A retrospective single center cohort study**  
Mehta, A., Patel, P. V., Caruso, T., Anderson, T. A.  
LIPPINCOTT WILLIAMS & WILKINS.2021: 401-402
- **Diagnostic Point-of-Care Ultrasound: Recommendations From an Expert Panel.** *Journal of cardiothoracic and vascular anesthesia*  
Bronshsteyn, Y. S., Anderson, T. A., Badakhsh, O., Boublik, J., Brady, M. B., Chamin, J. E., Coker, B. J., Deriy, L. B., Hardman, H. D., Haskins, S. C., Hollon, M., Hsia, H. J., Neelankavil, et al  
2021
- **Publication misrepresentation amongst pediatric anesthesiology fellowship applicants: A retrospective single center cohort study.** *Paediatric anaesthesia*  
Mehta, A., Patel, P., Caruso, T. J., Anderson, T. A.  
2021
- **Pediatric Anesthesia, an Issue of Anesthesiology Clinics, Volume 38-3.** *Anesthesia and analgesia*  
Anderson, T. A.  
2021; 132 (5): e68
- **Ex Vivo Whole Nerve Electrophysiology Setup, Action Potential Recording, and Data Analyses in a Rodent Model.** *Current protocols in neuroscience*  
Sun, S., Delgado, J., Behzadian, N., Yeomans, D., Anderson, T. A.  
2020; 93 (1): e99
- **Rates of, and Risk Factors for, Chronic Pain in Children and Young Adults Before and After Surgery**  
Thapa, I., Ward, A. T., De Souza, B., Bambos, N., Anderson, T. A.  
LIPPINCOTT WILLIAMS & WILKINS.2020: 691
- **Association Of Race and Ethnicity with Postoperative Analgesic Administration and Pain Scores in Pediatric Patients: A Single-Center Study of 29,614 Surgical Cases**  
Perez, F. D., De Souza, B., Wang, E., Rosenbloom, J. M., Anderson, T. A.  
LIPPINCOTT WILLIAMS & WILKINS.2020: 680-81
- **Association between regional anesthesia and analgesic outcomes: a single-center retrospective study of 2038 pediatric regional anesthetics**  
Xie, J. J., De Souza, B., Wang, E., Anderson, T. A.  
LIPPINCOTT WILLIAMS & WILKINS.2020: 862-63
- **Development and Validation of a Machine Learning Algorithm for Prediction of Prolonged Opioid Use After Surgery in Adolescents and Young Adults**  
Jani, T., Ward, A. T., De Souza, B., Bambos, N., Anderson, T. A.  
LIPPINCOTT WILLIAMS & WILKINS.2020: 712-13
- **Rates of, and Risk Factors for, Substance Use Disorder in Children and Young Adults Before and After Surgery**  
Thapa, I., Ward, A. T., De Souza, B., Bambos, N., Anderson, T. A.  
LIPPINCOTT WILLIAMS & WILKINS.2020: 689-90
- **Non-Opioid Analgesic Usage Among Pediatric Anesthesiologists: A Survey of Society for Pediatric Anesthesia Members.** *Paediatric anaesthesia*  
King, M. R., Wu, R. L., De Souza, E., Newton, M. A., Anderson, T. A.  
2020
- **Doing more and doing better: improving racial and ethnic disparities research in anaesthesiology.** *British journal of anaesthesia*  
Rosenbloom, J. M., King, M. R., Anderson, T. A.  
2020

- **Effects of High Neuromuscular Blocking Agent Dose on Postoperative Respiratory Complications in Infants and Children.** *Acta anaesthesiologica Scandinavica*  
Scheffenbichler, F. T., Rudolph, M. I., Friedrich, S., Althoff, F. C., Xu, X., Spicer, A. C., Patrocinio, M., Ng, P. Y., Deng, H., Anderson, T. A., Eikermann, M.  
2019
- **Anesthesia Workspace Cleanliness and Safety: Implementation of a Novel Syringe Bracket Using 3D Printing Techniques.** *Anesthesiology research and practice*  
Long, D. R., Doney, A., Bartels, D. L., Tan, C. E., Sayal, P. K., Anderson, T. A., Agarwala, A. V.  
2019; 2019: 2673781
- **The Opioid Wars-CON The Risks of Opioids for Pain Management Outweigh the Benefits** *CLINICAL JOURNAL OF PAIN*  
Anderson, T. A.  
2019; 35 (6): 463–67
- **High-Frequency Heart Rate Variability Index: A Prospective, Observational Trial Assessing Utility as a Marker for the Balance Between Analgesia and Nociception Under General Anesthesia.** *Anesthesia and analgesia*  
Anderson, T. A., Segaran, J. R., Toda, C., Sabouri, A. S., De Jonckheere, J.  
2019
- **Association Between Race and Ethnicity in the Delivery of Regional Anesthesia for Pediatric Patients: A Single-Center Study of 3189 Regional Anesthetics in 25,664 Surgeries.** *Anesthesia and analgesia*  
King, M. R., De Souza, E. n., Rosenbloom, J. M., Wang, E. n., Anderson, T. A.  
2019
- **Is a Retrolaminar Approach to the Thoracic Paravertebral Space Possible? A Human Cadaveric Study** *REGIONAL ANESTHESIA AND PAIN MEDICINE*  
Sabouri, A., Crawford, L., Bick, S. K., Nozari, A., Anderson, T. A.  
2018; 43 (8): 864–68
- **Complications in Pediatric Regional Anesthesia: An Analysis of More than 100,000 Blocks from the Pediatric Regional Anesthesia Network.** *Anesthesiology*  
Walker, B. J., Long, J. B., Sathyamoorthy, M., Birstler, J., Wolf, C., Bosenberg, A. T., Flack, S. H., Krane, E. J., Sethna, N. F., Suresh, S., Taenzer, A. H., Polaner, D. M., Martin, et al  
2018
- **Epidural Anesthesia to Facilitate Organ Blood Flow During the First Penile Transplantation in the United States: A Case Report.** *A&A practice*  
Ruscic, K. J., Zamora-Berridi, G. J., McGovern, F. J., Cetrulo, C., Winograd, J. M., Eberlin, K. R., Bojovic, B., Ko, D. S., Anderson, T. A.  
2018; 10 (9): 232-234
- **IS HIGH-FREQUENCY HEART RATE VARIABILITY INDEX A MARKER FOR THE BALANCE BETWEEN ANALGESIA AND NOCICEPTION DURING LAPAROSCOPIC CHOLECYSTECTOMY IN ADULTS UNDER GENERAL ANESTHESIA?**  
Anderson, T. A., Houle, T., Deng, H., Toda, C., Sabouri, A. S., Rudin, A. S., Segaran, J. R.  
LIPPINCOTT WILLIAMS & WILKINS.2018: 447–48
- **Intraoperative Esmolol as an Adjunct for Perioperative Opioid and Postoperative Pain Reduction: A Systematic Review, Meta-analysis, and Meta-regression** *ANESTHESIA AND ANALGESIA*  
Gelineau, A. M., King, M. R., Ladha, K. S., Burns, S. M., Houle, T., Anderson, T.  
2018; 126 (3): 1035–49
- **Cardiac Output Measurements Based on the Pulse Wave Transit Time and Thoracic Impedance Exhibit Limited Agreement With Thermodilution Method During Orthotopic Liver Transplantation.** *Anesthesia and analgesia*  
Magliocca, A. n., Rezoagli, E. n., Anderson, T. A., Burns, S. M., Ichinose, F. n., Chitilian, H. V.  
2018; 126 (1): 85–92
- **Opioid-free anesthesia using continuous dexmedetomidine and lidocaine infusions in spine surgery.** *Korean journal of anesthesiology*  
Kim, D. J., Bengali, R., Anderson, T. A.  
2017; 70 (6): 652-653
- **Heart rate variability: implications for perioperative anesthesia care** *CURRENT OPINION IN ANESTHESIOLOGY*

- Anderson, T.  
2017; 30 (6): 691–97
- **Evidence for the Efficacy of Systemic Opioid-Sparing Analgesics in Pediatric Surgical Populations: A Systematic Review.** *Anesthesia and analgesia*  
Zhu, A., Benzon, H. A., Anderson, T. A.  
2017; 125 (5): 1569-1587
  - **To Stop or Not, That Is the Question: Acute Pain Management for the Patient on Chronic Buprenorphine.** *Anesthesiology*  
Anderson, T. A., Quaye, A. N., Ward, E. N., Wilens, T. E., Hilliard, P. E., Brummett, C. M.  
2017; 126 (6): 1180-1186
  - **Raman Spectroscopy Differentiates Each Tissue from the Skin to the Spinal Cord: A Novel Method for Epidural Needle Placement?** *Anesthesiology*  
Anderson, T. A., Kang, J. W., Gubin, T., Dasari, R. R., So, P. T.  
2016; 125 (4): 793-804
  - **Age-related incidence of desaturation events and the cardiac responses on stroke index, cardiac index, and heart rate measured by continuous bioimpedance noninvasive cardiac output monitoring in infants and children undergoing general anesthesia.** *Journal of clinical anesthesia*  
King, M. R., Anderson, T. A., Sui, J., He, G., Poon, K. Y., Coté, C. J.  
2016; 32: 181-8
  - **Perioperative Dexamethorphan as an Adjunct for Postoperative Pain: A Meta-analysis of Randomized Controlled Trials.** *Anesthesiology*  
King, M. R., Ladha, K. S., Gelineau, A. M., Anderson, T. A.  
2016; 124 (3): 696-705
  - **The effectiveness of nasal mask vs face mask ventilation in anesthetized, apneic pediatric subjects over 2 years of age: a randomized controlled trial.** *Paediatric anaesthesia*  
Itagaki, T. n., Gubin, T. A., Sayal, P. n., Jiang, Y. n., Kacmarek, R. M., Anderson, T. A.  
2016; 26 (2): 173–81
  - **Phantom Limb Pain: A Review.** *International anesthesiology clinics*  
Luo, Y. n., Anderson, T. A.  
2016; 54 (2): 121–39
  - **Anesthetic considerations in organ procurement surgery: a narrative review.** *Canadian journal of anaesthesia = Journal canadien d'anesthésie*  
Anderson, T. A., Bekker, P., Vagefi, P. A.  
2015; 62 (5): 529-39
  - **Continuous noninvasive cardiac output in children: is this the next generation of operating room monitors? Initial experience in 402 pediatric patients.** *Paediatric anaesthesia*  
Coté, C. J., Sui, J. n., Anderson, T. A., Bhattacharya, S. T., Shank, E. S., Tuason, P. M., August, D. A., Zibaitis, A. n., Firth, P. G., Fuzaylov, G. n., Leeman, M. R., Mai, C. L., Roberts, et al  
2015; 25 (2): 150–59
  - **Volatile anesthetics for status asthmaticus in pediatric patients: a comprehensive review and case series.** *Paediatric anaesthesia*  
Carrié, S. n., Anderson, T. A.  
2015; 25 (5): 460–67
  - **Ultrasound-guided peripheral nerve blocks for ventricular shunt revision in children. A & A case reports**  
King, M. R., Anderson, T. A.  
2014; 3 (12): 157-9
  - **Perioperative anesthesia management of the burn patient.** *The Surgical clinics of North America*  
Anderson, T. A., Fuzaylov, G.  
2014; 94 (4): 851-61
  - **Anesthetic considerations in Sheldon-Hall syndrome.** *Paediatric anaesthesia*  
Anderson, T. A., Kasser, J. R., Holzman, R. S.  
2014; 24 (5): 538-40

- **Allocation of resources for organ transplantation.** *Anesthesiology clinics*  
Kandula, P., Anderson, T. A., Vagefi, P. A.  
2013; 31 (4): 667-74
- **Sequence determinants of a conformational switch in a protein structure.** *Proceedings of the National Academy of Sciences of the United States of America*  
Anderson, T. A., Cordes, M. H., Sauer, R. T.  
2005; 102 (51): 18344-9
- **Role of an N(cap) residue in determining the stability and operator-binding affinity of Arc repressor.** *Biophysical chemistry*  
Anderson, T. A., Sauer, R. T.  
2003; 100 (1-3): 341-50
- **The Use of Epinephrine in Caudal Anesthesia Increases Stroke Volume and Cardiac Output in Children.** *Regional anesthesia and pain medicine*  
Liu, C. A., Sui, J. n., Coté, C. J., Anderson, T. A.  
; 41 (6): 780–86