Stanford



# Ellen Wang

- Clinical Professor, Anesthesiology, Perioperative and Pain Medicine
- Clinical Professor, Clinical Informatics


### CLINICAL OFFICE (PRIMARY)

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## Bio

### BIO

Ellen Wang, MD is a Clinical Professor in the Departments of Anesthesiology, Perioperative and Pain Medicine and Clinical Informatics, and Medical Director of Clinical Informatics for Perioperative Services at Lucile Packard Children's Hospital Stanford. She is board-certified in Pediatric Anesthesiology and Clinical Informatics, with particular emphasis on EHR enhancement and optimization projects that support surgical, nursing, and pediatric and obstetric anesthesia workflows. She is also Chief of Operations of the Stanford Chariot Program, combining her interest in clinical care, process improvement, data analytics and research with virtual/augmented reality technologies to advance and evolve standards in patient care.

### CLINICAL FOCUS

- Pediatric Anesthesiology
- Regional Anesthesia
- Pre-Anesthesia Clinic
- Clinical Informatics
- Immersive Technologies
- Pediatric Anesthesia

### ACADEMIC APPOINTMENTS

- Clinical Professor, Anesthesiology, Perioperative and Pain Medicine
- Clinical Professor, Clinical Informatics

### ADMINISTRATIVE APPOINTMENTS

- Medical Director of Clinical Informatics, Perioperative Services, Information Services, Stanford Children's Health, (2012- present)

### PROFESSIONAL EDUCATION

- Internship: Alameda Health System Highland Hospital (2004) CA
- Board Certification: Clinical Informatics, American Board of Preventive Medicine (2017)

- Fellowship: Stanford University Anesthesiology Residency (2012) CA
- Board Certification, Clinical Informatics , American Board of Preventative Medicine (2017)
- Board Certification: Pediatric Anesthesia, American Board of Anesthesiology (2013)
- Residency: UCLA (2007) CA
- Medical Education: University of California San Francisco (2003) CA
- Board Certification: Anesthesia, American Board of Anesthesiology (2008)
- Fellowship: Children's Hospital Boston (2008) MA

### LINKS

- Stanford Chariot Lab Website: https://chariotlab.stanford.edu/
- Stanford Chariot Program: http://chariot.stanford.edu/
- SUPRA Stanford University Pediatric Regional Anesthesia: http://suppra.stanford.edu/
- Pediatric Anesthesia Division: http://med.stanford.edu/pedsanesthesia.html

## Publications

### PUBLICATIONS

- **Active virtual reality increases pain tolerance compared to passive virtual reality: a randomized crossover study of healthy volunteers.** *Anesthesia and pain medicine*
  Rodriguez, S. T., Makarewicz, N., Jimenez, R. T., Sridhar, K., Wang, E. Y., Suen, M. Y., Zuniga-Hernandez, M., Ko, B., Feng, R., Pinedo, K., Arshad, F., Caruso, T. J.
  2026

- **Virtual Reality Education for Hospitalized Pediatric Patients Improves Intrinsic Motivation: A Prospective, Randomized Crossover Study.** *Clinical pediatrics*
  Collins, F., Moya, E., Rojas-Pino, M. S., Zuniga-Hernandez, M., Arshad, F., Feng, R., Wang, E. Y., Rodriguez, S. T., Jackson, C., Caruso, T. J.
  2026: 99228261460362

- **Sound and Third-Person Perspective in Virtual Reality Improves Awe: A Prospective Study of Hospitalized Children and Caregivers.** *Games for health journal*
  He, E. M., Suen, A. M., Liu, P., Zuniga-Hernandez, M., Feng, R., Gardner, K., Jackson, C., Rodriguez, S. T., Wang, E., Caruso, T. J.
  2026: 2161783X261421429

- **Family Engagement With Pediatric Anesthetic Records: A Qualitative Study of Provider-Guardian Communication and Record Design.** *Paediatric anaesthesia*
  Wallace, K. J., Douglass, M., Gessner, D., Shi, J., Faragalla, M., Schmiesing, C., Wang, E. Y., Xie, J.
  2026

- **Transnasal humidified rapid-insufflation ventilatory exchange (THRIVE) use in a pediatric population: A prospective, randomized controlled trial.** *Journal of clinical anesthesia*
  Wang, E. Y., Renuart, A. J., Flynn, S. G., Van Pelt, H., Devavaram, P., Bulich, L. A., Stein, M. L., Ravula, N. R., Dhamrait, R. S., Kennedy, K. M., Suen, M. Y., Jackson, C., Gupta, et al
  2026; 109: 112117

- **Verifying Facts in Patient Care Documents Generated by Large Language Models Using Electronic Health Records.** *NEJM AI*
  Chung, P., Swaminathan, A., Goodell, A. J., Kim, Y., Momsen Reincke, S., Han, L., Deverett, B., Sadeghi, M. A., Ariss, A. B., Ghanem, M., Seong, D., Lee, A. A., Coombes, et al
  2026; 3 (1): AIdbp2500418

- **Augmented Reality Medical Simulation: A Multi-Site Study of Factors That Influence Acceptance.** *Paediatric anaesthesia*
  Wang, E. Y., Castro, S., Zhang, L., Suen, M. Y., Parris, M., Marks, A., Weser, V., Longhini, A. B., Strupp, K. M., Hernandez, M. R., Libaw, J. S., Kupiec-Weglinski, S., Lockhart, et al
  2025

- **Vibration therapy during needle procedures improves pain sensitivity while worsening pain threshold: A randomized, crossover study of healthy volunteers.** *The journal of vascular access*
  Rodriguez, S. T., Sheira, D., Castro, S., Zuniga-Hernandez, M., Wang, E. Y., Gardner, K., Hijazi, M., Shang, L., Nguyen, H., Stacey, H., Young, L., Cocanower, C., Chriss, et al
  2025: 11297298251366739

- **Patient Perspectives on Accessing, Understanding, and Using Their Anesthetic Records: A Qualitative Study.** *Anesthesia and analgesia*
  Shi, J., Xie, J., Schmiesing, C., Wang, E. Y., Gessner, D. M.
  2025

- **Examining the Effectiveness of Synchronized Vibratory Gameplay for Analgesia During Vascular Access: A Randomized, Controlled Trial**
  Shang, L., Castro, S., Kennedy, K., Mitchell, T., Suen, M., Rodriguez, S., Wang, E., Caruso, T.
  LIPPINCOTT WILLIAMS & WILKINS.2025: 898

- **Sharing Anesthetic Records with Patients: An Opportunity to Embrace Transparency.** *Anesthesiology*
  Xie, J., Gessner, D., Ramaswamy, P., Tan, J. M., Guffey, P., Gálvez Delgado, J., Lonsdale, H., Kato, M., Taicher, B. M., Zhang, D. A., Wecksell, M., Asher, D., Simpao, et al
  2025; 142 (5): 950-951

- **Augmented Reality Medical Simulation: A Multi-Site Study of Acceptance**
  Castro, S., Shang, L., Suen, A., Parris, M., Marks, A., Strupp, K., Hernandez, M., Libaw, J., Lockhart, T., Olbrecht, V., Lai-ning, L., Rodriguez, S., Caruso, et al
  LIPPINCOTT WILLIAMS & WILKINS.2025: 1156

- **Culturally Sensitive Treatment of Caregiver Anxiety With Virtual Reality: A Prospective, Pragmatic, Randomized Study.** *Journal of patient experience*
  Jimenez, R. T., Zuniga-Hernandez, M., Suen, M. Y., Feng, R., Pinedo, K., Arshad, F., Collins, F., Ganesan, A., Jackson, C., Wang, E. Y., Rodriguez, S. T., Caruso, T. J.
  2025; 12: 23743735251326671

- **Virtual reality improves pain threshold and recall in healthy adults: A randomized, crossover study.** *Journal of clinical anesthesia*
  Rodriguez, S. T., Jimenez, R. T., Wang, E. Y., Zuniga-Hernandez, M., Titzler, J., Jackson, C., Suen, M. Y., Yamaguchi, C., Ko, B., Kong, J. T., Caruso, T. J.
  2025; 103: 111816

- **The Physiologic Effect of Augmented Reality Simulation Versus Traditional Simulation: A Noninferiority, Randomized Controlled Trial.** *The journal of education in perioperative medicine : JEPM*
  Rama, A., Rojas-Pino, M. S., Wang, E. Y., Rodriguez, S. T., Suen, M. Y., Titzler, J. S., Zuniga-Hernandez, M., Jackson, C., Rosales, O., Collins, F., Caruso, T. J.
  2025; 27 (1): E740

- **Verifying Facts in Patient Care Documents Generated by Large Language Models Using Electronic Health Records** *NEJM AI*
  Chung, P., et al
  2025; 3 (1)

- **Acceptance of Virtual Reality in Trainees Using a Technology Acceptance Model: Survey Study.** *JMIR medical education*
  Wang, E. Y., Qian, D., Zhang, L., Li, B. S., Ko, B., Khoury, M., Renavikar, M., Ganesan, A., Caruso, T. J.
  2024; 10: e60767

- **Multicentre analysis of severe perioperative adverse events in children undergoing surgery who were infected with SARS-CoV-2: a propensity score-adjusted analysis.** *British journal of anaesthesia*
  Saynhalath, R., Sanford, E. L., Kato, M. A., Staffa, S. J., Zurakowski, D., Meier, P. M., Alex, G. A., Fuller, C. L., Rossmann Beel, E. N., Chhabada, S., Poppino, K. F., Szmuk, P., Matava, et al
  2024

- **A technology acceptance model to predict anesthesiologists' clinical adoption of virtual reality.** *Journal of clinical anesthesia*
  Wang, E. Y., Kennedy, K. M., Zhang, L., Zuniga-Hernandez, M., Titzler, J., Li, B. S., Arshad, F., Khoury, M., Caruso, T. J.
  2024; 98: 111595

- **Awe Inducing Elements in Virtual Reality Applications: A Prospective Study of Hospitalized Children and Caregivers.** *Games for health journal*

He, E. M., Arshad, F., Li, B. S., Brinda, R., Ganesan, A., Zhang, L., Fehr, S., Renavikar, M., Rodriguez, S. T., Wang, E., Rosales, O., Caruso, T. J.
2024

- **Artificial Intelligence in Perioperative Care: Opportunities and Challenges.** *Anesthesiology*
  Han, L., Char, D. S., Aghaeepour, N.
  2024; 141 (2): 379-387
- **Enhancement of Immersive Technology Use in Pediatric Health Care With Accessible, Context-Specific Training: Descriptive Feasibility Study.** *JMIR XR and spatial computing*
  Li, B. S., Fereday, B., Wang, E., Rodriguez, S., Forssell, K., Bollaert, A. N., Menendez, M., Caruso, T. J.
  2024; 1: e56447
- **Virtual Reality Facilitated Exercise Increases Sympathetic Activity and Reduces Pain Perception: A Randomized Crossover Study.** *American journal of physical medicine & rehabilitation*
  Rodriguez, S. T., Makarewicz, N., Wang, E. Y., Zuniga-Hernandez, M., Titzler, J., Jackson, C., Suen, M. Y., Rosales, O., Caruso, T. J.
  2024
- **Augmented Reality Improves Pediatric Mask Induction: A Prospective, Matched Case-Control Study.** *Journal of patient experience*
  Yun, R., He, E. M., Zuniga, M., Guo, N., Wang, E. Y., Ho, F., Pearson, M., Rodriguez, S. T., Caruso, T. J.
  2024; 11: 23743735241241146
- **A prospective, observational validation of HRAD±, a novel pediatric affect and cooperation scale.** *Journal of clinical anesthesia*
  Yun, R., Qian, D., Wang, E., Zuniga, M., Forbes, T., Li, B., Rodriguez, S. T., Jackson, C., Caruso, T. J.
  2024; 94: 111410
- **Reducing Preoperative Caregiver Anxiety With Virtual Reality: A Pragmatic, Randomized Controlled Study.** *Journal of patient experience*
  Fonseca, A., Qian, D., Forbes, T., Li, B. S., Lee, C., Burdsall, K., Rodriguez, S., Jackson, C., Wang, E. Y., Caruso, T. J.
  2024; 11: 23743735231220190
- **Enhancement of Immersive Technology Use in Pediatric Health Care With Accessible, Context-Specific Training: Descriptive Feasibility Study** *JMIR XR and Spatial Computing*
  Li, B., Fereday, B., Wang, E., Rodriguez, S., Forssell, K., Bollaert, A., Menendez, M., Caruso, T. J.
  2024; 1
- **A Quality Improvement Project to Improve the Utilization of an Intraoperative Rapid Response System.** *Pediatric quality & safety*
  Rama, A., Qian, D., Forbes, T., Wang, E., Knight, L., Berg, M., Caruso, T. J.
  2023; 8 (6): e686
- **Perioperative Regional Anesthesia Pain Outcomes in Children: A Retrospective Study of 3,160 Regional Anesthetics in Routine Practice.** *The Clinical journal of pain*
  Xie, J., De Souza, E., Perez, F., Suárez-Nieto, M. V., Wang, E., Anderson, T. A.
  2023
- **Effect of an electronic medical record nudge to improve quality improvement program tracking of neuraxial catheter replacements in obstetric patients.** *BMJ open quality*
  Fedoruk, K., Xie, J., Wang, E., Fowler, C., Riley, E., Carvalho, B.
  2023; 12 (4)
- **Predicting pediatric healthcare provider use of virtual reality using a technology acceptance model.** *JAMIA open*
  Wang, E. Y., Kennedy, K. M., Zhang, L., Qian, D., Forbes, T., Zuniga-Hernandez, M., Li, B. S., Domingue, B., Caruso, T. J.
  2023; 6 (3): ooad076
- **Virtual reality facilitated exercise improves pain perception: A crossover study.** *Journal of clinical anesthesia*
  Rodriguez, S. T., Makarewicz, N., Wang, E. Y., Zuniga-Hernandez, M., Titzler, J., Jackson, C., Suen, M. Y., Rosales, O., Caruso, T. J.
  2023; 91: 111257
- **Effectiveness of an early operating room start time in managing pediatric trauma.** *World journal of orthopedics*
  Kym, D., Kaur, J., Pham, N. S., Klein, E., Langner, J. L., Wang, E., Vorhies, J. S.
  2023; 14 (7): 516-525

- **Prehospital Pediatric Emergency Training Using Augmented Reality Simulation: A Prospective, Mixed Methods Study.** *Prehospital emergency care*
  Friedman, N., Zuniga-Hernandez, M., Titzler, J., Suen, M. Y., Wang, E., Rosales, O., Graham, J., D'Souza, P., Menendez, M., Caruso, T. J.
  2023: 1-18
- **Automated Alert System of Second-Line Uterotonic Drug Administration.** *A&A practice*
  Abir, G., Riley, E. T., Oakeson, A. M., Judy, A., Wang, E., Carvalho, B.
  2023; 17 (5): e01687
- **Keeping an Open Mind About Open Notes: Sharing Anesthesia Records With Patients.** *Anesthesia and analgesia*
  Ramaswamy, P., Xie, J., Marsiglio, A. M., Burgart, A. M., Schmiesing, C. A., Cohen, N. H., Robinowitz, D. L., Wang, E.
  2022; 135 (4): 697-703
- **Enhanced Recovery After Cleft Palate Repair: A Quality Improvement Project.** *Paediatric anaesthesia*
  Esfahanian, M., Marcott, S. C., Hopkins, E., Burkart, B., Khosla, R., Lorenz, H. P., Wang, E., De Souza, E., Algaze-Yojay, C., Caruso, T. J.
  2022
- **Communication Skills Training Using Remote Augmented Reality Medical Simulation: a Feasibility and Acceptability Qualitative Study.** *Medical science educator*
  Hess, O., Qian, J., Bruce, J., Wang, E., Rodriguez, S., Haber, N., Caruso, T. J.
  2022: 1-10
- **Assessing Pediatric Life Support Skills Using Augmented Reality Medical Simulation With Eye Tracking: A Pilot Study.** *The journal of education in perioperative medicine : JEPM*
  Qian, J., Rama, A., Wang, E., Wang, T., Hess, O., Khoury, M., Jackson, C., Caruso, T. J.
  2022; 24 (3): E691
- **Association of Race and Ethnicity with Pediatric Postoperative Pain Outcomes.** *Journal of racial and ethnic health disparities*
  Rosenbloom, J. M., De Souza, E., Perez, F. D., Xie, J., Suarez-Nieto, M. V., Wang, E., Anderson, T. A.
  2022
- **Quantifying virtual reality pain modulation in healthy volunteers: A randomized, crossover study.** *Journal of clinical anesthesia*
  Neiman, N. R., Falkson, S. R., Rodriguez, S. T., Wang, E. Y., Hemphill, S. F., Khoury, M. E., Kist, M. N., Jackson, C. D., Caruso, T. J.
  2022; 80: 110876
- **Novel Utilization of Strand-Specific Reverse Transcription Polymerase Chain Reaction in Perioperative Clinical Decision Making for SARS-CoV-2 Polymerase Chain Reaction Positive Patients.** *Paediatric anaesthesia*
  Jette, C. G., Wang, T., Wang, E., Man, J. Y., Mireles, S., Maass, B., Mathew, R., Pinsky, B. A., Claure, R., D'Souza, G.
  2022
- **A Pilot Quality Improvement Project to Reduce Intraoperative MRI Hypothermia in Neurosurgical Patients.** *Pediatric quality & safety*
  Wong, B. J., Rama, A., Caruso, T. J., Lee, C. K., Wang, E., Chen, M.
  2022; 7 (2): e531
- **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
- **Real-time reorientation and cognitive load adjustment allow for broad application of virtual reality in a pediatric hospital.** *Journal of clinical and translational research*
  Caruso, T. J., Fonseca, A., Barreau, A., Khoury, M., Menendez, M., Wang, E., Lawrence, K., Jackson, C., Rodriguez, S.
  1800; 7 (6): 750-753
- **Development and assessment of an efficient pediatric affect and cooperation scale.** *Journal of clinical anesthesia*
  Kennedy, K., Wang, E., Rodriguez, S. T., Qian, J., Khoury, M., Kist, M. N., Jackson, C., Yun, R., Caruso, T. J.
  2021; 76: 110569
- **Pre-operative fasting times for clear liquids at a tertiary children's hospital; what can be improved?** *Anesthesia and pain medicine*
  Schmidt, A. R., Fehr, J., Man, J., D'Souza, G., Wang, E., Claure, R., Mendoza, J.

2021

- **Integrated eye tracking on Magic Leap One during augmented reality medical simulation: a technical report** *BMJ SIMULATION & TECHNOLOGY ENHANCED LEARNING*
  Caruso, T. J., Hess, O., Roy, K., Wang, E., Rodriguez, S., Palivathukal, C., Haber, N.
  2021; 7 (5): 431-434
- **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
- **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.
  LIPPINCOTT WILLIAMS & WILKINS.2021: 795-797
- **Transnasal Humidified Rapid-Insufflation Ventilatory Exchange (THRIVE) Use During Microdirect Laryngoscopy and Bronchoscopy: Initial Data from a Randomized, Prospective, Multi-Collaborative Trial**
  Swanger, A., Yun, R., Olbrecht, V., Winograd, V., Evans, M. A., Stein, M., Ravula, N., Menendez, M., Wang, E., Sidell, D., Caruso, T.
  LIPPINCOTT WILLIAMS & WILKINS.2021: 784-785
- **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.
  LIPPINCOTT WILLIAMS & WILKINS.2021: 795-797
- **Integrated eye tracking on Magic Leap One during augmented reality medical simulation: a technical report.** *BMJ simulation & technology enhanced learning*
  Caruso, T. J., Hess, O., Roy, K., Wang, E., Rodriguez, S., Palivathukal, C., Haber, N.
  2021; 7 (5): 431-434
- **Leveraging VR/AR to combat chronic pain in youth: Position paper from the Interdisciplinary Network on Virtual and Augmented (AR/VR) Technologies for Pain (INOVATE-Pain) Management.** *Journal of medical Internet research*
  Logan, D. E., Simons, L. E., Caruso, T. n., Gold, J. I., Greenleaf, W. n., Griffin, A. n., King, C. n., Menendez, M. n., Olbrecht, V. n., Rodriguez, S. n., Silvia, M. n., Stinson, J. n., Wang, et al
  2021
- **Virtual reality for pediatric periprocedural care.** *Current opinion in anaesthesiology*
  Wang, E. n., Thomas, J. J., Rodriguez, S. T., Kennedy, K. M., Caruso, T. J.
  2021; 34 (3): 284–91
- **Virtual Reality Augments Movement during Physical Therapy: A Pragmatic Randomized Trial.** *American journal of physical medicine & rehabilitation*
  Hemphill, S. n., Rodriguez, S. n., Wang, E. n., Koeppen, K. n., Aitken-Young, B. n., Jackson, C. n., Simons, L. n., Caruso, T. J.
  2021
- **Virtual Reality Facilitates Engagement in Physical Therapy in the Pediatric CVICU.** *Pediatric physical therapy : the official publication of the Section on Pediatrics of the American Physical Therapy Association*
  Hemphill, S. n., Nguyen, A. n., Kwong, J. n., Rodriguez, S. T., Wang, E. n., Caruso, T. J.
  2021; 33 (1): E7–E9
- **Incidence of and Factors Associated With Prolonged and Persistent Postoperative Opioid Use in Children 0-18 Years of Age.** *Anesthesia and analgesia*
  Ward, A., De Souza, E., Miller, D., Wang, E., Sun, E. C., Bambos, N., Anderson, T. A.
  2020; 131 (4): 1237-1248
- **Association Between Race and Ethnicity with Intraoperative Analgesic Administration and Initial Recovery Room Pain Scores in Pediatric Patients: a Single-Center Study of 21,229 Surgeries.** *Journal of racial and ethnic health disparities*
  Jette, C. G., Rosenbloom, J. M., Wang, E., De Souza, E., Anderson, T. A.
  2020
- **A Retrospective Cohort Study of Predictors and Interventionsthat Influence Cooperation with Mask Induction in Children.** *Paediatric anaesthesia*

Marquez, J. L., Wang, E., Rodriguez, S. T., O'Connell, C., Munshey, F., Darling, C., Tsui, B., Caruso, J., Caruso, T. J.
2020

- **A Quality Improvement Project to Reduce Combination Acetaminophen-opioid Prescriptions to Pediatric Orthopedic Patients.** *Pediatric quality & safety*
  Caruso, T. J., Trivedi, S., Chadwick, W., Gaskari, S., Wang, E., Marquez, J., Lagasse, S., Bailey, M., Shea, K.
  2020; 5 (3): e291

- **Augmented Reality as a Tool to Reduce Fear and Promote Cooperation During Pediatric Nasal Endoscopy**
  Madill, M., Caruso, T. J., Sidell, D., Meister, K., Wang, E., Menendez, M., Rodriguez, S.
  LIPPINCOTT WILLIAMS & WILKINS.2020

- **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

- **Quantifying Virtual Reality Pain Modulation in Healthy Volunteers through Ice Immersion**
  Neiman, N., Hemphill, S., Lawrence, K., Khoury, M., Kist, M., Menendez, M., Rodriguez, S., Wang, E., Caruso, T.
  LIPPINCOTT WILLIAMS & WILKINS.2020: 585–86

- **Reducing Anxiety, Fear, and Pain with Virtual Reality in Pediatric Outpatient Orthopedic Clinic**
  Kist, M., Neiman, N., Khoury, M., Hastings, K., Menendez, M., Wang, E., Caruso, T., Rodriguez, S.
  LIPPINCOTT WILLIAMS & WILKINS.2020: 707

- **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

- **Retrospective Review of the Safety and Efficacy of Virtual Reality in a Pediatric Hospital.** *Pediatric quality & safety*
  Caruso, T. J., O'Connell, C., Qian, J. J., Kung, T., Wang, E., Kinnebrew, S., Pearson, M., Kist, M., Menendez, M., Rodriguez, S. T.
  2020; 5 (2): e293

- **MINDFULNESS-BASED VIRTUAL REALITY: A PROMISING MIND-BODY INTERVENTION FOR YOUTH WITH INFLAMMATORY BOWEL DISEASE**
  Wren, A., Neiman, N., Madill, M., Taylor, K., Rives, H., Menendez, M., Wang, E., Caruso, T., Rodriguez, S., Nguyen, L.
  W B SAUNDERS CO-ELSEVIER INC.2020: S104-S105

- **Mobilization and calibration of the HTC VIVE for virtual reality physical therapy.** *Digital health*
  Hemphill, S., Nguyen, A., Rodriguez, S. T., Menendez, M., Wang, E., Lawrence, K., Caruso, T. J.
  2020; 6: 2055207620950929

- **MINDFULNESS-BASED VIRTUAL REALITY: A PROMISING MIND-BODY INTERVENTION FOR YOUTH WITH INFLAMMATORY BOWEL DISEASE**
  Wren, A., Neiman, N., Madill, M., Taylor, K., Rives, H., Menendez, M., Wang, E., Caruso, T., Rodriguez, S., Nguyen, L.
  OXFORD UNIV PRESS INC.2020: S64

- **State of the art in clinical decision support applications in pediatric perioperative medicine.** *Current opinion in anaesthesiology*
  Wang, E. n., Brenn, B. R., Matava, C. T.
  2020

- **Introduction of the EMR-integrated I-PASS ICU Handoff Tool.** *Pediatric quality & safety*
  Caruso, T. J., Su, F. n., Wang, E. n.
  2020; 5 (4): e334

- **Using Augmented Reality to Reduce Fear and Promote Cooperation During Pediatric Otolaryngologic Procedures.** *The Laryngoscope*
  Caruso, T. J., Madill, M. n., Sidell, D. n., Meister, K. n., Wang, E. n., Menendez, M. n., Kist, M. N., Rodriguez, S. n.
  2020

- **A Pilot Quality Improvement Project to Reduce Preoperative Fasting Duration in Pediatric Inpatients.** *Pediatric quality & safety*

Nye, A., Conner, E., Wang, E., Chadwick, W., Marquez, J., Caruso, T. J.
2019; 4 (6): e246

- **A multifaceted quality improvement project improves intraoperative redosing of surgical antimicrobial prophylaxis during pediatric surgery** *PEDIATRIC ANESTHESIA*
  Colletti, A. A., Wang, E., Marquez, J. L., Schwenk, H. T., Yeverino, C., Sharek, P. J., Caruso, T. J.
  2019; 29 (7): 705–11
- **INCIDENCE OF PERSISTENT OPIOID USE IN CHILDREN AFTER SURGERY**
  Anderson, T. A., Ward, A. T., De Souza, B., Wang, E., Miller, D., Bambos, N.
  LIPPINCOTT WILLIAMS & WILKINS.2019: 764–65
- **Intraoperative antibiotic redosing compliance and the extended postoperative recovery period: Often overlooked areas that may reduce surgical site infections** *PEDIATRIC ANESTHESIA*
  Caruso, T. J., Wang, E. Y., Colletti, A. A., Sharek, P. J.
  2019; 29 (3): 290-291
- **Differential Lung Ventilation Using a Bronchial Blocker in a Pediatric Patient on Extracorporeal Membrane Oxygenation: A Case Report.** *A&A practice*
  Bhargava, V. n., Arastu, A. n., Darling, C. n., Wang, E. n., Kache, S. n.
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