Anesthesiology Research Collaborative (ARC) Research Newsletter

Spring 2026 Newsletter

Welcome to the TPMG *Anesthesiology* Research Newsletter!

The goal for the Anesthesia Research Collaborative is to promote and facilitate anesthesia and perioperative medicine research within Kaiser Permanente and The Permanente Medical Group, collaborate and learn from each other and other specialty groups, and tap into the vast potential of our integrated healthcare system to improve care for our patients.

Here we will highlight current or recently completed research projects led by clinician researchers and ongoing studies led by investigators at the Division of Research (DOR) involving our clinician researchers.

A Deeper Look Inside This Update:

- Research Highlight
- Upcoming events & funding
- Specialty Announcements
- Active and recent research projects
- Recent peer reviewed publications

DARE Delivery Science and Applied Research
The Permanente Medical Group

Research Highlights:

New pain block technique as effective for reducing post-mastectomy pain

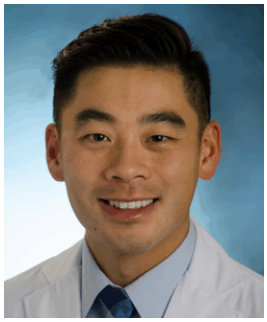
Sue Rochman
September 16, 2025

Kaiser Permanente study compared two regional anesthesia techniques used during breast cancer surgery

Two pain block techniques are equally effective in reducing opioid use after a mastectomy, new Kaiser Permanente research shows.

The study, published in the Journal of Pain Research, compared two regional anesthesia techniques: a pectoralis nerve (PECS) block and an erector spinae plane (ESP) block. The PECS block is commonly used for breast cancer surgeries; the ESP block is often used in other types of chest and back surgeries but is newer to the breast cancer setting.

The findings should provide reassurance to breast cancer patients who have concerns about optimal pain management.



"There are many factors that go into determining if a pain block will be used during surgery and, if so, what type of block," said first author Edward Yap, MD, an anesthesiologist with The Permanente Medical Group and a physician researcher at the Kaiser Permanente Division of Research. "There hasn't been a lot of research comparing the PECS block with the ESP block, and we believed doing this study at Kaiser Permanente could help guide care provided to all breast cancer patients."

The retrospective study included 517 breast cancer patients who had a mastectomy without reconstruction that included a nerve block between 2017 and 2020 at a Kaiser Permanente Northern California (KPNC) hospital. Within this group, 428 patients had a PECS block and 89 had an ESP block.

A PECS block is injected into the connective tissue near the chest's pectoral muscles to block pain in the nerves and muscles in the chest wall. The ESP block is injected into connective tissue alongside the spine in the upper thoracic area, where it can control pain in the chest, breast tissue, and middle back.

The study found no significant difference in total opioid use after surgery, average pain scores, or maximum pain scores based on the type of block the patient received. Length of hospital stays, postoperative nausea and vomiting, readmission, and new postmastectomy pain within 6 months of surgery also were about the same in both groups. However, the patients who received the ESP block group did receive more non-opioid options for pain relief after surgery than the patients who had the PECS block.

"Postoperative pain management is a cornerstone of breast cancer care," said study co-author Elizabeth Linehan, MD, a breast surgical oncologist with The Permanente Medical Group. "Using a nerve block during surgery can decrease the use of opioids to treat pain after surgery, and it's important to know that both of these options are equally effective in supporting mastectomy patients."

A common procedure

More than 287,000 people in the U.S. are diagnosed with breast cancer each year, and about 100,000 of these patients will have treatment that includes a mastectomy. Studies have found that a regional pain block helps to control pain after surgery and can reduce both recovery time and a patient's risk of developing persistent post-mastectomy pain. It also reduces a patient's risk of becoming dependent on opioids.

Before a mastectomy procedure, the surgeon and the anesthesiologist will discuss whether a block will be used and, if so, what kind. KPNC uses an enhanced recovery pathway for all mastectomy procedures that encourages regional anesthesia. Factors that can determine what type of pain block will be used include the patient's age and pain history, hospital practices, and expected length of the surgery.

"Our study really underscores the importance of multimodal pain management and multidisciplinary coordination in achieving the best outcomes for our patients," said Linehan. "Breast cancer treatment is very multidisciplinary outside the operating room, with medical oncologists, radiation oncologists, radiologists, plastic surgeons, pathologists, social workers, navigators, and geneticists working together, and that thread continues into the operating room with our anesthesiologists."

Added Yap, "Most patients don't meet the person who will be their anesthesiologist until the day of their surgery. We hope our patients know that before we meet them, we have carefully considered the pain blocks and other anesthesia options available and discussed with the surgeon what we think will be best for them."

The study was funded by Kaiser Permanente Community Health.

Co-authors include Julia Wei, MPH, of the Division of Research; Curtis Darling, MD, and Kevin P. Ng, MD, of The Permanente Medical Group; and Matthias Behrends, MD, of the University of California, San Francisco.

https://divisionofresearch.kaiserpermanente.org/pain-block-mastectomy/

Research Highlights Cont'd:

Automated tool can predict appointment length needed to counsel patients before surgery

Sue Rochman
January 7, 2026

Perioperative medicine score developed by Kaiser Permanente researchers allows clinicians to schedule longer appointments for specific patients

Kaiser Permanente researchers have developed and implemented an automated tool that can predict the length of time a patient scheduled for surgery will require for a comprehensive preoperative appointment. By blocking out the appropriate amount of time on the doctor's and patient's schedules, Kaiser Permanente Northern California (KPNC) is able to provide optimal care to every patient and keep schedules running smoothly, the study's authors said.

The findings were reported in Anesthesiology.

"Not all patients who are having surgery are the same," said study co-author Bradley Cohn, MD, an anesthesiologist and the chair of perioperative medicine for KPNC."Some are fit, healthy, and active and are having a relatively low-risk surgery," Cohn explained. "Others may be having a high-risk surgery or have many other medical conditions they are managing. And others are anywhere in between. Our goal was to figure out how you objectively evaluate this huge population of patients, determine which ones are which, and then schedule each patient appropriately."

The new tool, called TimEHR, is embedded in a patient's electronic health record. It uses information about the type of surgery and its risks as well as the patient's health history to establish a TimEHR score. The score is used to determine whether a patient's preoperative appointment should be scheduled for 20, 40, or 60 minutes, and if the appointment can be virtual or should be in-person.

"Our clinicians and teams want to provide the very best care for our patients preparing for surgery," said senior author Vincent Liu, MD, MSc, a research scientist with the Kaiser Permanente Division of Research (DOR) and chief data officer for The Permanente Medical Group (TPMG). "By using data available within the EHR to determine the length of POM appointments we ensure patients receive personalized care leading up to these procedures."

To develop the TimEHR score, the research team mined information contained in KPNC's audit log, which automatically records when a nurse, doctor, pharmacist, or other care provider opens and closes a patient's electronic health record. Federal HIPAA regulations mandate that these time-stamped audit logs be part of any comprehensive electronic health record system used in the U.S.

"This data is a new frontier in health data analysis," said first author Sidney Le, MD, a DOR research scientist and surgeon with TPMG. "The audit-log data shows the amount of time providers spend in the electronic medical record – such as before, with, or after seeing a patient, checking on a patient's medications, following up on test results, or reviewing the medical record. We were able to quantify that data and then use it to predict how long patients would need for their preoperative appointment."

TimEHR was developed on a data set that included 65,800 patients who had presurgical appointments with a POM team within 30 days of an elective surgery. It was validated in a study that included 94 physicians and advanced practitioners. The final model uses 129 of 397 potential patient factors to predict the time needed for a preoperative appointment. The most important factors are age, presence of other health issues, coronary artery disease, heart failure, need for an interpreter, and use of blood thinners. The tool is now used routinely throughout KPNC.

Next, the researchers intend to look for ways to use audit log data to schedule time-specific appointments in other outpatient settings, such as primary care. "The work this team has done is actually very generalizable," said Cohn. "This study is focused on perioperative medicine, but it's really about how you right-size clinics and match patients with the right appointment, with the right provider, for the right amount of time."

The study was funded by the National Institute on Aging, the National Institutes of Health, and The Permanente Medical Group Delivery Science Fellowship Program.

Co-authors include Brian Lawson, PhD, Yun Lu, MD, MPH, and Patricia Kipnis, PhD, from the Division of Research, and Andrea M. Gochi, MD, of the University of California, San Francisco.

https://divisionofresearch.kaiserpermanente.org/tool-presurgery-appointment-length/

Upcoming Events

CSA 2026 Annual Anesthesia Conference and Board Meeting
Dates: April 09 – 12, 2026
Location: Anaheim, CA
For more information:
https://csahq.org/events/csa-2026-annual-anesthesia-conference-and-board-meeting/

ASRA: 51st Annual Regional Anesthesiology and Acute Pain Medicine Meeting
Dates: April 16 – 18, 2026
Location: Pheonix, Arizona
For more information:
https://asra.com/events-education/ra-acute-meeting

IARS 2026 Annual Meeting
Dates: May 1 – 3, 2026
Location: Montreal, Canada
For more information:
https://meetings.iars.org/past-future-meetings/future/

ANESTHESIOLOGY 2026 | October 16 - 20, 2026 | San Diego, CA | San Diego Convention Center
Dates: October 16th – 20th, 2026
Location: San Diego, CA
For more information:
https://www.asahq.org/annualmeeting

2026 SOAP Annual meeting Leveraging Technology for Better Outcomes Improving Lives of Patients & Clinicians
Dates: April 29th – May 3rd, 2026
Location: For more information:
https://www.soap.org/

Internal Funding & Research Resources

- **General Funding Opportunities**
- **Delivery Science and Applied Research**
- **Specialty Research Networks**
- **Getting Started with Research**
- **Division of Research**

Active (ongoing) Research Projects and Collaborations

Risk associated with type of neuromuscular blockade in patients with chronic kidney disease
Kevin Ng, Mary Reed, Lusine Gigoyan | Rapid Analytics Unit | 2025 Ongoing

Outcomes of multimodal analgesia and regional anesthesia utilization in the geriatric population across Kaiser Permanente Northern California medical centers
Edward Yap, Mary Reed | Physician Researcher Program | 2025 Ongoing

Recent Peer Reviewed Anesthesiology Authored Publications; Jan – Dec 2025

*KPNC authors listed in alphabetical order below. For details on author order, click on the link included to the PubMed Abstract.

Virtual reality compared to nitrous oxide for labor analgesia: A feasibility pilot, prospective, randomized, cross-over, non-inferiority study
Authors: Hoang, Dan | International Journal Of Obstetric Anesthesia | November 1, 2025 | PubMed abstract

First Reported Case of Intracardiac Kimura Disease
Authors: Chen, John L; Chen, Patty Pei-Chang; Lapunzina, Paul M; Rana, Jamal S; Sheikh, Ahmad; Tashjian, Jessica A | Jacc. Case Reports | October 29, 2025 | PubMed abstract

Post-Intensive Care Syndrome Awareness and Communication: Surveys of ICU Providers and Patients
Authors: Nagi, Sukhvinder K | Chest | October 10, 2025 | PubMed abstract

Perioperative cardiac arrest: a rare event worth measuring
Authors: Yap, Edward N | British Journal Of Anaesthesia | September 22, 2025 | PubMed abstract

Erector Spinae Plane versus Pectoralis Nerve Block for Mastectomy in Cancer Patients: A Retrospective, Multicenter Cohort Study
Authors: Darling, Curtis E; Ng, Kevin P; Shurell, Elizabeth M; Wei, Julia; Yap, Edward N | Journal Of Pain Research | September 16, 2025 | PubMed abstract

Development and validation of an EHR-based risk prediction model for geriatric patients undergoing urgent and emergency surgery

Authors: Chang, Robert W; Cohn, Bradley R; Hwang, Judith C; Yap, Edward N; Huang, Jie; Reed, Mary E; Reed, Mary E | Bmc Anesthesiology | January 27, 2025 | PubMed abstract

Impact of Fascial Plane Block on Postoperative Length of Stay and Opioid Use Among Colectomy Patients Within an Established Enhanced Recovery After Surgery Program: A Retrospective Cohort Study

Authors: Khersonsky, Jonathan; Yap, Edward N; Alavi, Mubarika; Campbell, Cynthia I; Campbell, Cynthia I | Journal Of Pain Research | January 1, 2025 | PubMed abstract