

Kaiser Permanente
Research

Surgical outcomes research

A playbook for smarter surgical care





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— Ron Loo, MD

Across Southern California, Permanente physicians use research findings to drive improvements in the quality of surgical care. Strategies range from a rigorous evaluation of new technologies to registry-based research and network-funded clinical trials.

Rollout of robotic surgery

In 2000, the U.S. Food and Drug Administration approved the robotic da Vinci Surgical System for minimally invasive surgeries. A decade later, surgical robots were assisting more than 3 out of 4 prostatectomies in the United States.

At first, little evidence showed robotic surgery offered better outcomes. Kaiser Permanente Southern California initially held a conservative stance. As data began to emerge, however, the region moved ahead. The first robot arrived at the Kaiser Permanente West Los Angeles Medical Center in 2008.

“For very specific procedures, robotic surgery was shown to improve short-term outcomes,” said Kirk Tamaddon, MD, director of KPSC’s Robotic Program. “We got started with robot-assisted radical prostatectomy.”

Research guides program development

New questions emerged. Which other procedures might be a good match for robotic surgery? How should new surgeons be trained?

“When a technology is new, the entire playbook is not yet written,” said Ron Loo, MD, regional coordinating chief of urology for KPSC. “Research helps us understand the smartest way forward, so we can achieve better outcomes.”

Each procedure undergoes a rigorous approval process. Part of that process is obtaining Institutional Review Board approval to collect data on new procedures.



“We gather outcomes data for every procedure at both the patient and individual surgeon level,” said Dr. Loo. “We use every method available to us, including our electronic medical record, data from our clinical analysis group, and patient-reported outcomes.”

The program has gradually expanded to other medical centers and other specialties—including general surgery, gynecology, and thoracic surgery—all informed by this rigorous evaluation process.

The game-changing play: quality of life

Prostate cancer is the second most common cancer among American men, but causes only 2 to 3% of cancer deaths.

“Because the survival rate for prostate cancer is very high, quality of life is very important to our patients,” said Gary Chien, MD, program director for the Urology Residency Program at the Los Angeles Medical Center. “Urinary control, sexual function, and recovery become as important as cancer control.”

Dr. Chien is the principal investigator for a study that seeks to understand how different treatments for prostate cancer—including robotic surgery—affect quality of life.

“Right now, quality of life is one of the least-studied aspects of medicine,” said Dr. Chien. “Knowing how treatment choices influence quality of life will help us practice smarter medicine.”

Cover page: Dr. Ron Loo, Dr. Shawn Menefee, Dr. Kirk Tamaddon

Above: Dr. Gary Chien, Teresa Harrison, Jeff Slezak



Joint Replacement Registry

Each year, more than a million Americans undergo knee or hip replacement surgery. Patients and surgeons navigate a multitude of choices about implant types and surgical procedures.

Research based on Kaiser Permanente's National Joint Replacement Registry provides much-needed evidence to guide those choices. The registry includes more than 160,000 cases.

"We conduct comparative effectiveness studies to identify the best types of products and procedures for our patients," said Liz Paxton, MA, director of Surgical Outcomes and Analysis, who oversees the Joint Replacement Registry and 7 other implant registries. "We translate what we learn into quality improvement tools."

Requests spark practical research ideas

Orthopedic surgeon Dhiren Sheth, MD, wanted to compare outcomes of hip replacement techniques. Newer techniques approach the joint from the front or the side of the hip rather than from the back of the hip.

"A lot of patients wanted me to do the surgery from the front," said Dr. Sheth, who practices at Kaiser Permanente Orange County. "They've heard recovery is easier—they can bend forward, cross their legs, or sit in a low chair."

Dr. Sheth teamed up with Robert Namba, MD, an attending surgeon for the Department of Orthopedic Surgery at Kaiser Permanente Orange County and one of

the founders of the Joint Replacement Registry. With the support of Kaiser Permanente's Surgical Outcomes and Analysis group, Dr. Sheth found the answer to his question.

"We found that there was a significant reduction in the risk of dislocation with approaches from the front," said Dr. Sheth. "We had an idea that might be the case, but it was good to validate from the registry that it was true."

High-priority questions fuel investigations

Reducing hospital readmissions is a top priority for Kaiser Permanente and other hospitals across the country. Medicare recently identified total hip replacements as an area targeted for improvement.

A study based on registry data found that 3.6% of Kaiser Permanente members had been readmitted to the hospital within 30 days of a total hip replacement. This rate was relatively low compared to studies based on data from other health care organizations, which have shown rates ranging from 4 to 11%.

The study identified a number of factors that increased the risk of readmission. Some of these could be addressed proactively, potentially resulting in better outcomes for patients.

"We saw that if these patients had pulmonary disease, they had an increased risk of being readmitted to the hospital," said Dr. Namba. "Knowing that, we can plan for it. We can coordinate with our internal medicine colleagues before, during, and after surgery to optimize that patient's care."

Above: Dr. Tadashi Funahashi, Liz Paxton, Dr. Robert Namba

Next page, top: Donna LaPorte, Dr. Robert Namba

Next page, below: Dr. Shawn Menefee

Smart tools drive practice changes

Recent questions about the benefits and safety of a common medication for osteoporosis—bisphosphonates—prompted a study about how the drug might influence outcomes for total hip replacements.

The study revealed a positive association for older patients with osteoporosis. Those patients were less likely to need a revision surgery if they were taking bisphosphonates.

“The relationship became stronger when bone quality was more impaired,” said Monti Khatod, MD, an orthopedic surgeon at the West Los Angeles Medical Center. “On the other hand, patients with normal bone quality who had been on bisphosphonates had no improvement. In some cases, we actually saw an increased risk of fracture.”

A new SmartSet in Kaiser Permanente HealthConnect makes use of those findings. Before surgery, the SmartSet prompts the surgeon to order bone density scans for patients who haven’t already had them.



“The goal is to reverse risk factors in order to improve outcomes,” said Dr. Khatod. “In this case, we built a tool right in our electronic health record, based on evidence from our own research. I think that’s a great example of smarter medicine.”

Q&A: Networks for smarter clinical trials

Kaiser Permanente participates in a number of research networks, ranging from cancer clinical trials to cardiovascular research studies. These collaborations bring together larger study populations and broaden areas of expertise.



Shawn A. Menefee, MD, a urogynecologist at Kaiser Permanente San Diego, has been site principal investigator for 2 National Institutes of Health research networks: the Urinary Incontinence Treatment Network and the Pelvic Floors Disorder Network.

Why are research networks important?

As part of an NIH network, you receive funding to stabilize your research infrastructure. You don’t have to worry about funding, so you can focus on pertinent scientific questions. Also, the size and scale of the network enables us to enroll more patients, power studies appropriately, and have a bigger impact.

How do networks contribute to smarter medicine?

One of the UITN studies focused on a test called urodynamics. It is a common test before surgery for stress urinary incontinence. But there wasn’t any evidence that the tests improved outcomes.

We evaluated whether performing the test changed the physician’s choice of surgery or changed the outcome of the surgery. We found that it didn’t.

Did the study influence practice here?

Yes. We did a follow-up study to look at Kaiser Permanente’s ability to implement the findings. We found there was a significant decrease in the number of urodynamics tests performed in Southern California.

In essence, that’s smarter medicine. First, finding out whether something improves care. Then, actually listening to the evidence. As a result, patients no longer have to undergo an hour of uncomfortable tests.

One of your current trials involves robotic surgery.

We’re evaluating the benefit of using robotic surgery to perform sacrocolpopexy—a procedure to repair a pelvic prolapse. This procedure is a long one. Laproscopically, it takes 3 to 5 hours.

Our question is, can we do it more quickly and safely, and just as effectively, with robotic surgery? We’re also looking at the ergonomics of robotic versus laproscopic surgery. Can we prolong our surgeons’ careers by making it better on their backs, shoulders, and necks?

One of the great things about our affiliations with networks is that we can access expertise from other institutions. For this study, we’ve brought in a computer science motion capture expert from UC San Diego to help us with the ergonomic assessment.

Does participating in research influence your practice?

Yes. Every day. When you treat your patients, you know that you are treating them based on the most up-to-date evidence or you are finding newer evidence.

I love being a physician. I love taking care of patients. And I think we can improve care for a greater number of women by participating in clinical research.