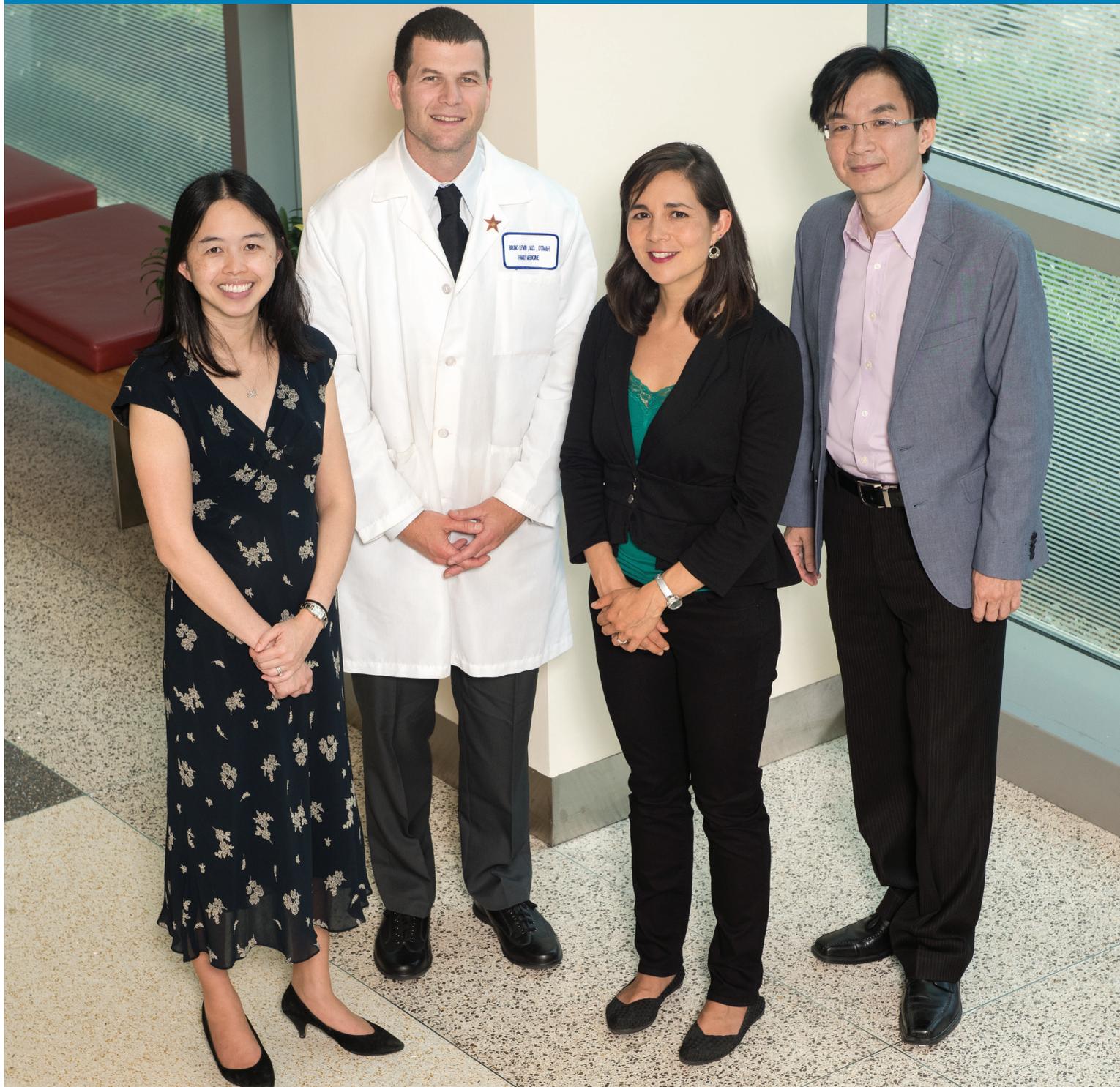


Kaiser Permanente Research

Center for Vaccine Safety and Effectiveness Research

Vaccine research leads to smarter recommendations





The Kaiser Permanente Southern California Center for Vaccine Safety and Effectiveness Research gives physicians confidence to recommend immunizations to the youngest, the oldest, and the most vulnerable of patients.

Day to day, physicians see sick patients, often prescribing them medications to make them healthy. When physicians administer vaccines, though, the patient is usually already healthy. The idea is to keep them that way. So, before recommending vaccines, physicians seek extra assurance that the immunizations meet the highest levels of safety and effectiveness.

That's why the Kaiser Permanente Southern California Center for Vaccine Safety and Effectiveness Research is so important. It gives physicians confidence to recommend immunizations to the youngest, the oldest, and the most vulnerable of patients.

Senior Director of Research Steven Jacobsen, MD, PhD, said the program focuses on vaccine safety, vaccine effectiveness, and barriers to appropriate vaccination.

"At the end of the day, we are trying to figure out how to best launch and execute our vaccine programs," Dr. Jacobsen said.

Or as Lina Sy, MPH, the senior research project manager in the vaccine program, puts it: "When you think of prevention, you think of vaccines. Immunizations are an important part of our care."

Vaccinating surgical patients for the flu

Often the discoveries within the vaccine program are made because of the close collaboration between physicians and researchers.

With the flu vaccine, some surgeons were reluctant to immunize surgery patients in the hospital due to concerns it could cause a fever or other issues that might mimic complications of surgery. Calvin C. Yu, MD, chief integration officer for KPSC, saw the issue when he reviewed vaccination numbers. Gunter Rieg, MD, the regional infection control officer based at the Kaiser



Permanente South Bay Medical Center, saw it on the hospital floor. They both knew there was a place to get answers at KPSC: the Department of Research & Evaluation.

"The hypothesis comes from the bedside," Dr. Rieg said. "And the answers from the research."

Researcher Sara Tartof, PhD, MPH, is part of a group of infectious disease specialists who meet regularly from across the Southern California Region. She was able to frame the research question, get funding from the Centers for Disease Control and Prevention-supported Vaccine Safety Datalink, and conduct the research with the input of physicians.

The study found that surgical patients who received the flu vaccine during their hospital stay had no increased risk of emergency department visits or subsequent hospitalizations in the week following discharge, compared with surgical patients who did not receive the vaccine.

"What our research can do is educate physicians, and promote smarter medicine," Dr. Tartof said.

Bruno Lewin, MD, a family practice physician at the Los Angeles Medical Center, said that getting the message across to surgeons was easier after the research findings were published.

"It's much harder to argue with data that come from your own patients," Dr. Lewin said.

Cover: Lina Sy, Dr. Bruno Lewin, Dr. Sara Tartof, Dr. Hung Fu Tseng

Above: Dr. Bruno Lewin, Dr. Sara Tartof



Dr. Yu said one of the advantages of Kaiser Permanente is that questions can be answered relatively quickly. And then the findings are shared and implemented. He noted that the study also led to a better understanding of when surgeons were most comfortable administering the vaccine: the day of discharge.

"This is really one of the instances that shows that physicians and researchers can work together to improve public health," Dr. Yu said.

By July 2016, Dr. Rieg had already shared the study with more than a half dozen surgical chief groups in advance of the next flu season. He focused on the safety of the vaccine, and introduced the idea that it might even better protect patients in the post-surgical period.

"I really expect a clear increase in the number of surgical patients being vaccinated for the flu," Dr. Rieg said. "It's something to build on as years go by."

Improving HPV vaccination rates

Human papillomavirus immunization has had unique issues because the immunizations are recommended for those ages 9 years through young adulthood and HPV is passed through sexual contact, which affects the conversation between doctors and their teen patients and parents.

Above: Dr. Bradley Ackerson, Julisa Oropeza

Next page, above: Dr. John Sim, Jennie Lewis

Next page, below: Dr. Jim Nomura, Erica Yang

The virus affects both males and females and can cause health problems, including genital warts and cancers of the cervix, anus, and throat.

The CDC recommendation for the HPV4 vaccine for boys went through several changes over the years, including from "permissive use" to "routine use." A 2015 study found that rate of the HPV4 vaccination among boys enrolled in KPSC increased as the guidelines grew more encouraging: from 1.6% in 2009 to 18.5% in 2013.

"By identifying the gaps in the initiation and completion rates of the HPV4 vaccine series, we hope to help physicians determine which populations need more intervention to improve our vaccination rates," said the study's lead author, Rulin Hechter, MD, PhD.

Researcher Sharon M. Hudson, PhD, MA, looked at the issue of HPV vaccination of young people from a different perspective. What distinguishes medical centers with higher rates of the HPV immunization series completion from those with lower rates?

She said higher immunization rates were often a result of a "teamwork/pro-HPV culture."

"In the higher-completion medical centers, just about everybody recognized the importance of HPV series completion and entire departments worked together to achieve this goal. They had the attitude: It's just what you do," Dr. Hudson said. "In the lower-completion medical centers, the team working on it was a doctor and nurse."

She noted the medical centers with higher completion rates were more proactive, making appointments for patients rather than telling them to make appointments themselves. This became the norm because of the support physicians received from all levels of their department—from the staff to the chiefs.

Vaccinating against shingles

Researcher Hung Fu Tseng, PhD, MPH, was at a conference in Taiwan in 2014 when physicians brought him a question. They asked if giving the shingles vaccine to patients with end-stage renal disease and on dialysis was effective, because the immune systems of patients on dialysis aren't as responsive as those of the general population. Back at home, physicians were wondering the same thing. The shingles vaccine contains a live virus, so there is extra concern about giving it to people with poor immune systems.



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— Hung Fu Tseng, PhD, MPH

“Because of our conservative nature and our motto to ‘do no harm,’ we naturally defaulted to not giving the vaccine to this patient population,” said nephrologist John J. Sim, MD, who is the area research chair at the Los Angeles Medical Center.



About 8,000 KPSC patients have end-stage renal disease. Dr. Sim and other nephrologists at KPSC each manage between 50 and 100 dialysis patients.

Dr. Tseng launched a study that found that elderly patients with end-stage renal disease who received the shingles vaccine were half as likely to develop shingles as those who were not vaccinated.

That’s all Dr. Sim needed to hear.

“It was reassuring that the vaccine didn’t cause harm and actually benefited this patient population,” Dr. Sim said, “and, especially since it was a study from our own clinical practice environment, it gave us confidence to vaccinate.”

Vaccine research is important to health

Dr. Tseng said he is deeply gratified that the work he and the KPSC vaccine research team do helps people live healthier lives.

“We have a wealth of information here. We want to make the best use of it and bring the best science to the public,” Dr. Tseng said. “And that is certainly not just a job. It’s a blessing.”

Clinical trial tests *C. diff* vaccine

Kaiser Permanente Southern California is participating in an international clinical trial to prevent infection from the *Clostridium difficile* bacteria. The common and resilient bacterium, which can cause symptoms ranging from mild diarrhea to life-threatening colitis, is a growing public health concern.

The U.S. Food and Drug Administration granted fast-track designation to the study, which is led by vaccine maker Sanofi Pasteur. The investigational vaccine stimulates the immune system to produce antibodies that bind the toxins generated by the *C. difficile* bacteria upon exposure, to prevent clinical disease even if patients become infected with *C. diff*.

“Patients come to the hospital for care for their medical condition. We don’t want them to develop a potentially serious or even fatal complication like *C. diff* infection while they are here,” said Jim Nomura, MD, site principal investigator for the Cdiffense trial at Kaiser Permanente Southern California and infectious disease specialist at the Kaiser Permanente Los Angeles Medical Center.

“If this vaccine proves efficacious,” he said, “it can help reduce the risk by making sure a patient is immune before entering the hospital.”

While this trial focuses on a potential means to prevent hospital-acquired infection, other KPSC



studies provide additional perspectives. One study suggests that the community may also play a key role in transmission of *C. diff* and emphasizes the importance of testing for it in outpatient settings. Several others look at the appropriate prescription and use of antibiotics.

As a large integrated health care system, Kaiser Permanente brings a real-world environment to the Cdiffense vaccine study. The large and diverse patient population and vast electronic health record provide an opportunity to help improve patient care at Kaiser Permanente—and beyond.

The potential of the Cdiffense study is promising. Dr. Nomura adds, “offering a vaccine like this, which protects patients from a dangerous infection in high-risk settings, is a great way to practice smarter medicine.”