DEPARTMENT OF **RESEARCH & EVALUATION** 2019 Annual Report

Kaiser Permanente **Research**

STRETCHING THE FRONTIER

Research improving health and well-being

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Message from the Senior Director



Each year, as I read through our Annual Report, it's an opportunity for reflection. This time, that reflection feels more profound. As we compiled this report, a global pandemic unfolded around us. The stories and photos are from a time when our experience of working together was quite different, before social distancing and universal masking. It's nice to see the faces of so many of our investigators, staff, and clinical collaborators, who have done such amazing and important work.

Over the past decade and a half, we've stretched our research capabilities to new frontiers, all with the aim of using our research to improve health and well-being for our members and our communities. We've gone from a small program, with a half a dozen scientists and 60 staff, to a team of more than 30 scientists, a growing contingent of physician researchers, and several hundred staff around the Southern California region.

What makes our program so vital is the robust connection between our research and care teams, as shown in the stories throughout this report. That connection informs our research, helping us to answer highimpact clinical questions and apply what we learn to improve care delivery and health.

Our work is improving health across the continuum, from prevention to treatment to survivorship. Our research team routinely engages with clinicians, from residents to regional chiefs, to produce research that transforms care delivery. Increasingly, we are bringing other scientists together, spearheading expert meetings and scientific conferences, to promote clinically relevant, real-world research.

As we rounded the corner from 2019 to 2020, we didn't know we would be compelled to stretch even further to explore the new frontier of COVID-19. But the foundation we've laid together has prepared us as well as possible for this moment. We will undoubtedly have powerful stories to tell in 2020.

To all of our researchers and staff, at the Department of Research & Evaluation and at medical centers around the Southern California region, I would like to express my profound gratitude. The work we are doing to protect and improve health has never felt more urgent, not only for our own Kaiser Permanente members but for communities around the world. Thank you for all that you do.

Steven J. Jacobsen, MD, PhD Senior Director of Research

To learn more about research underway in 2020, including COVID-19 projects, please visit our <u>website</u> (kp.org/research), <u>subscribe</u> to our IMPACT newsletter, or follow us on <u>Twitter</u> (@KPSCalResearch).



Screening cancer patients for distress



Wahid Wakach and Dr. Erin Hahn

hen she was a new scientist at Kaiser Permanente Southern California, Erin E. Hahn, PhD, MPH, had an intense interest in cancer research. Oncologists invited her into their quarterly meetings so she could see and hear the challenges they faced. One of those challenges was depression and anxiety among cancer patients.

Dr. Hahn and others worked together to tackle the issue and how their findings could make life better for cancer patients.

Her research was presented at a scientific conference in 2019. It showed that screening breast cancer patients for distress was possible and valuable for identifying those who needed mental health services but hadn't yet reached out for help. In early 2020, researchers began the process of rolling out distress screenings to all cancer patients throughout Kaiser Permanente Southern California. "What we learned, and the ultimate message we want to convey, is that distress screening is a really important aspect of cancer care," Dr. Hahn said.

Approaching a clinical issue with research

Dr. Hahn works in the Department of Research & Evaluation's Division of Health Services Research & Implementation Science. Within that division, she is part of a team that works closely with clinicians and administrators to identify, prioritize, and solve problems related to quality and affordability through research.

Dr. Hahn had previously done work exploring the use of unnecessary testing for breast cancer patients. Her work showed that sometimes physicians performed those tests to help quell patient anxiety.

"It was an aha moment for me," she said.

Not only were physicians concerned about stress among their patients, it also was affecting care and affordability.

Her goals were to determine if a distress screening program could be effective within an integrated health care setting and what was the best way to implement it. She also was interested in finding out whether the screenings increased or decreased health care visits, and what patients, clinicians, and administrators thought about the program.

But approaching an issue that large was not easy. She and her team needed to determine how to approach it, narrow the focus of the research, build relationships, create a distress screening program that would be easy for physicians and staff to use, and then implement the program in a way that scientists could assess results. While distress screening is used in some medical areas within Kaiser Permanente, it was not used specifically for patients with cancer.

She also considered how the study should be designed, eventually deciding to include both quantitative and qualitative research methods, such as surveys and interviews.

Researchers partner with physicians

They decided to narrow the research to breast cancer patients. One of the first people Dr. Hahn partnered with was Farah M. Brasfield, MD, regional chief of hematology/oncology for the Southern California Permanente Medical Group, who specializes in breast cancer.

"Cancer can be very stressful because it takes the normality out of life," Dr. Brasfield said. "It's a lifethreatening condition that is often associated with death, and the treatment can disrupt people's dayto-day existence."

Dr. Brasfield said that patients with breast cancer will often suffer in silence, juggling the same load of work and family that they did before the diagnosis. Some of them don't even tell their spouses about their condition. They also can have additional stress because of the physical and hormonal changes they may undergo.



Dr. Farah Brasfield

The team sought out community partners to help represent the patient voice and bring different perspectives to the research.

Relationship-building important to research

Six breast cancer programs were randomly placed into 2 categories: those at medical centers where researchers worked with staff to actively promote the program using implementation strategies (audit and feedback, facilitation) and others where staff were alerted about the study but had no active engagement.

The researchers then began a process of meeting with nurses and physicians at each of the intervention sites to build support for the distress screenings, which were expected to happen during routine care.

"Our strategy was to try to get into any standing meeting that they already had," Dr. Hahn said. "We would try to get on their agenda or ask for an extra 10 minutes and try to build the relationship from there."

She said she and her team would show up for multiple meetings at each site to build relationships. They also sought out community relationships.

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Dr. Shannon La Cava and Nancy Good

Research looks to community for perspective

One of the people Dr. Hahn reached out to was Shannon La Cava, PsyD, the chief clinical officer and director of Programs & Research for the Cancer Support Community Los Angeles. The Cancer Support Community is a national nonprofit organization that provides free services to people and families affected by cancer. It also routinely conducts stress screening during patient intake.

"We were able to have some nice discussions on the front end about how to make distress screening successful for the Kaiser Permanente locations, based on what we've learned in our setting," Dr. La Cava said.

During the research phase, Dr. La Cava continued to give input during weekly group calls.

Dr. Hahn said, "We would often pepper her with questions, 'Oh, this situation came up. Shannon, has this ever happened to you? How did you deal with it?' She really helped us troubleshoot and problem solve throughout the course of the study."

At one point, the number of screenings went down at one of the sites. Researchers worried that the team had lost motivation. But Dr. La Cava suggested that the site may be having staffing problems.

That insight changed the researchers' approach. Their next email was friendlier in tone.

"It just said, 'We realize you might be having some challenges. We'd love to talk about it and help you out," Dr. Hahn said. "Then we were able to connect with them. It actually helped us a lot with that site."

Study results show the promise of screenings

In the study, there were 3 medical centers where researchers intervened and 3 control sites. About 1,400 patients were enrolled, with numbers balanced between control and intervention groups "Implementation of screening tools will allow us to better identify patients that need higher levels of support and guide them in that direction. It is gratifying to extend existing services to our cancer patients."

- Farah M. Brasfield, MD

as well as demographic and tumor characteristics. All patients were invited to complete surveys at 3 months, 6 months, and 12 months.

Eighty percent of patients were screened at intervention sites. Of those screened at intervention sites, 10% scored in the medium or high range, indicating a need for a behavioral health referral. Of those, 94% received an appropriate referral and 6% declined. And then, 75% completed a visit with a behavioral health provider.

The study also looked at health care utilization of the patients in primary care, urgent care, emergency department, and oncology visits.

"The only statistically significant outcome was in outpatient oncology, where our intervention group had less utilization than our control group," Dr. Hahn said. "Although this is a small difference, it may indicate that addressing distress could reduce patient visits."

Interviews revealed people's thoughts

In interviews after the screening study was complete, researchers learned that the physicians and nurses involved felt that what they had done was important and beneficial to patients and had minimal disruption to their clinical workflow. One oncologist said: "We treat our patients, not their illness...the people that they are. And part of that is their psychological well-being."



Photo courtesy of Kaiser Permanente Brand Photo Library

Patients similarly were pleased to have been screened: "I'm very much the type of person where it's mind over matter. If your mind isn't right, then...your body probably isn't going to be right, either...," one patient said.

Support is available for cancer patients

Oncologist Dr. Brasfield said the most important takeaway is that support services are available for cancer patients at Kaiser Permanente Southern California.

"There are a lot of resources and support systems for cancer patients, both inside and outside of our organization," she said. "Implementation of screening tools will allow us to better identify patients that need higher levels of support and guide them in that direction. It is gratifying to extend existing services to our cancer patients.

Resident research improves patient care



Dr. Joshua May and Dr. Jacqueline Nguyen

t the Kaiser Permanente Los Angeles Medical Center, pediatric resident Jacqueline Nguyen, MD, wanted to know how flu shots affected young patients with asthma. With help from her resident research advisor, she dug into data from electronic health records and found that flu vaccination reduced hospitalization rates for respiratory issues by 25% over the 6-year period studied.

"Residency research allowed me to investigate questions that I wanted to answer," Dr. Nguyen said, "especially during flu season, when many families can be skeptical about the benefits of flu vaccination."

Dr. Nguyen is emblematic of a growing number of residents throughout Kaiser Permanente Southern California who have helped improve clinical practice. In addition to Dr. Nguyen's work, research by residents in the Pediatrics Department at the Los Angeles Medical Center has led to better booking of follow-up appointments and fewer unexpected intubations among pediatric ICU patients.

Graduate medical education research informs practice

"Our graduate medical education research program provides a real-life world for residents to experience research," said Joshua May, MD, associate program director of the pediatric residency program at the Los Angeles Medical Center. "Their research experience is much more practical than in many places and can set them up for a strong future career."

"Wherever our residents go–whether they open a practice or stay with Kaiser Permanente–they'll "There's true alignment between our graduate medical education and our organizational goals of conducting patient-oriented research."

- Bechien U. Wu, MD, MPH

bring the perspective of a doctor who is always aware of areas for improvement and looking for ways to make things better," he added.

At Kaiser Permanente, physician and scientist research is continually improving the quality of care to patients and the community. Medical residents add to this learning cycle by using their fresh eyes to spot potential improvements and conducting research. They often present that work to physicians and the wider medical community, at conferences and through publications.

The group that oversees medical residencies in the United States, the Accreditation Council for Graduate Medical Education, requires residents to engage in scholarly activity during their education. The activity can vary greatly from resident to resident and program to program.

Resident research program formalized 5 years ago

KPSC formalized its research program for residents in 2015 when it hired 2 people to oversee the program. The aim was to provide structure and programming for research during residencies. At any given time, there are about 400 residents and fellows in the program.

Kristen R. Ironside, MA, the research program manager for graduate medical education at the Los Angeles Medical Center, said she believes they've "started to shift the culture of research within the residency space."

"We spent a lot of time training faculty who are now research champions within their departments,"



Dr. Bechien Wu

she said. "We've given them the confidence to do research projects and to teach, and by doing so, we've created new pathways for research."

New mentorship program increases research potential

In 2019, the Regional Research Committee introduced a new pilot program to fund research: a graduate medical education mentorship grant. The grant supports faculty mentors to develop research projects that are suitable for collaboration with residents and post-doctoral students.

"There's true alignment between our graduate medical education and our organizational goals of conducting patient-oriented research," said Bechien U. Wu, MD, MPH, chair of the committee. "From day 1, all our research efforts are oriented toward identifying areas where we can improve care for our members. The faculty mentors are the bridge for guiding the trainees and identifying some of those key questions so the residents and post-docs can be successful now and in the future."

The RRC funded 2 mentorship projects in 2019. John J. Sim, MD, area research chair for the Los Angeles Medical Center, and secondyear fellow Thet Aung, MD, focused on a study called "Polycystic kidney disease characteristics and comparative outcomes within a real-world environment."

They looked at whether there are racial or ethnic differences in the prevalence and progression in polycystic kidney disease. Researchers found that non-Hispanic whites and blacks had higher rates than Asians and Hispanics. The researchers used the work as preliminary data for a successful industry grant proposal. They are also using this study cohort to collaborate on a project with the radiology residency program. Mingsum Lee, MD, PhD, is program director for the cardiology fellowship training program at the Los Angeles Medical Center. She worked with secondyear cardiology fellow Cheng Chen, MD, on a study called "Acute myocardial infarction associated with the use of prescription medications."

They created a database of patients with acute myocardial infarction (AMI) that cardiology fellows could use to study questions they encountered in clinical practice. Dr. Chen was particularly interested in the safety of triptans, which are medications used to treat migraine headaches.



Dr. John Sim and Dr. Thet Aung

"Clinicians and residents are the source of a lot of really good questions. So here at R&E, we want to make things as friction free as possible, giving them the motivation and resources to find the answers."

- Annette L. Adams, PhD, MPH

Some concerns had been raised about a possible association between triptans and AMI. Through his research, Dr. Chen showed that treatment with triptan was not associated with a significantly increased risk of AMI.

The projects were so successful that the RRC enthusiastically supported expanding the 2019 pilot into a fully funded project in 2020.

Scientist appointed as research liaison

In 2019, the Department of Research & Evaluation designated one of its researchers, Annette L. Adams, PhD, MPH, as research navigator. She serves as the first point of contact in R&E for clinician researchers. She also partners with the graduate medical education research program managers Ironside and Davida Becker, PhD, MSc.

"Most of my work so far has been consulting on study design," Dr. Adams explained. "When people share a proposal or an idea, we talk about it and I try to gather information that our statistical unit will need to implement the project."

She also works with the clinicians and residents to think about decisions such as how to define illnesses and what co-variables might be important to consider.



Dr. Annette Adams

"Clinicians and residents are the source of a lot of really good questions," Dr. Adams said. "So here at R&E, we want to make things as friction free as possible, giving them the motivation and resources to find the answers."

Residency bolstered by research

Dr. Jacqueline Nguyen, who studied how flu shots affected young patients with asthma at the Los Angeles Medical Center, plans to become an outpatient general pediatrician with an emphasis on urgent care. She said one of the most memorable moments from her residency was when she received her preliminary data results.

"It made me realize the sheer impact and wealth of information that Kaiser Permanente has to draw upon," she said. "I'll never forget how my mentors, attendings, and colleagues reacted to my results. I understood how significant they were because they were so applicable to our daily practice."

Patient advisors revolutionize research



Matt Owen and Dr. Karen Coleman

ifteen years ago when Matt Owen was a freshman psychology major in college, he had a "psychotic break from reality."

"I started having hallucinations that altered my mind in a way that dealing with everyday life became challenging," he said. "It changed the course of my life."

Times were rocky for a while, including more than a year of being homeless. But with medication, therapy, and self-awareness, Owen has been able not only to turn his life around, but to help others. Now 33 and studying for his nursing license, he does that by helping guide behavioral research at Kaiser Permanente.

Owen serves 2 roles for Kaiser Permanente. As a patient advisor, he helps to guide physicians and health care professionals as they plan and improve programs. As a patient stakeholder, he helps investigators keep the patient in mind when conducting their research.

"The reason I'm a patient stakeholder is because it is very therapeutic. It is a nice way to contribute to the psychiatric field, to actually produce something valuable using my experience," Owen said. "It has been very enriching to see how a behavioral health care system works and to contribute to that as much as possible."

Patient involvement in research at KPSC

Kaiser Permanente Southern California has long relied upon patients for their experience and wisdom to help shape medical policies and programs. Currently, patients participate in 2 regional committees. One addresses general medical policies and projects. The other, on which Owen serves, focuses specifically on behavioral health. The patient advisors report to and advise the region's quality improvement leaders.

In the last few years, the idea of engaging patients to also help improve research has become more popular. R&E research scientist Karen J. Coleman, PhD, MS, began working with patient stakeholders 8 years ago while evaluating bariatric surgery outcomes.

More recently, she has worked to create an infrastructure for patient engagement in mental health research with funding by the Patient-Centered Outcomes Research Institute. The award is designed to integrate patients into the Mental Health Research Network, of which KPSC is a part.

Openness to patient input is increasing

"In the past, researchers may have hesitated to engage patients in research discussions because they may not have known how to address their specific needs for research," Dr. Coleman said. "But today, more researchers see the benefits of patient engagement, to help frame better research questions and better understand the results."

Dr. Coleman is exploring the potential for 3 different levels of patient engagement:

- A co-investigator level, in which a patient becomes a citizen scientist, involved in conducting and writing the research
- An advisory board, in which scientists work with patients on the board periodically to develop, test, and disseminate research ideas
- A larger population-based patient group that could help scientists understand if their ideas resonate with the needs of patients



Dr. Kristi Reynolds

Patients can give critical tips to researchers

Kristi Reynolds, PhD, MPH, recalled inviting a patient with a blood-clotting disorder to be part of the research team studying anticoagulation medications. The team had planned to use mail and phone calls to survey patients about how anticoagulation medications affected the patients' quality of life.

Dr. Reynolds, director of R&E's Division of Epidemiologic Research, said the patient helped the researchers develop the survey and put the questions in an order that made more sense from a patient's point of view.

"He also suggested that we offer the survey through email, which turned out to be very important for the study," Dr. Reynolds recalled.

The email response rate was so high that the team was able to conduct additional surveys and compare response rates between mail, phone calls, and email.



Dr. Huong Nguyen

"Email had the highest response," Dr. Reynolds said. "It really saved us money and helped us to reach more patients."

Some researchers see patient engagement as a necessity

Huong Q. Nguyen, PhD, RN, is a researcher whose work focuses on chronically ill adults and older adults. She said she engages patients in research out of pure necessity.

"We can't design interventions for patients, families, and caregivers if we don't talk to them, right?" she said. "You can't just design interventions in a vacuum and expect them to automatically love what you create."

The first R&E project that Dr. Nguyen worked with patient advisors on was the Walk-On! Physical Activity Coaching project from 2014 to 2018. It was designed to determine the effectiveness of a 12-month physical activity coaching program for people with chronic obstructive pulmonary disease, or COPD. She had 3 advisors initially during the proposal phase, which was then expanded to 8 advisors when the study was funded.

"Those advisors were instrumental in helping me pull together the proposal," she said, "from detailing what that program looks like to how it would actually meet the needs of people living with COPD."

Patient advisors become invested in projects

The advisors spent 4 years on the project, working on different aspects of the research. They helped refine study materials and create a patient-friendly consent form. Dr. Nguyen and the research team were able to engage about 25% of the patients with COPD that they approached.

"They were definitely sad when the study came to an end, because they saw each other as "My experience has allowed me to touch other peoples' lives in a way that is meaningful to me, at least. I hope it's meaningful to them."

- Matt Owen, patient advisor

support," Dr. Nguyen said. "They also wanted to continue to stay engaged and contribute to research."

The Walk-On! paper was published in *JAMA Network Open* in August 2019. Dr. Nguyen is currently working on a study about palliative care that uses palliative care caregivers as the advisors.

Sometimes there are challenges. Patient advisors might experience some disappointment when suggestions aren't implemented due to Institutional Review Board (IRB) rules meant to stringently protect research subjects. Other times a proposed intervention is dependent on factors they can't control, such as the willingness of doctors and nurses to implement a certain practice, Dr. Nguyen said.

"More often, I think, they make connections, make contributions, and benefit from the work," she said.

Owen's psychiatrist recommended him for patient advisor role

Matt Owen, the patient stakeholder in Dr. Coleman's research, said that the experience has been rewarding.

After learning to take care of himself, Owen looked for ways to help others. He was hired to be a peer counselor to others with mental



Matt Owen and Dr. Karen Coleman

health challenges. Four years ago, his psychiatrist recommended him for a patient advisor role at Kaiser Permanente. About a year ago, he became a patient stakeholder, and is working on a research project studying how peer counselors might benefit mental health patients.

"Working as an advocate has allowed me to help others in a way that is meaningful to me, and hopefully to them," he said. "I want to see people get better and make the moves that they need to live a more fulfilling life."

Owen said he's tried to give as much input as possible to the peer support project because it is something he knows so well.

Also, he added, "I think that the experience of using our own challenges and own experiences to help someone else out is one of the best things we can do."



CATALYST FOR CHANGE:

R&E-hosted conferences inspire patient-centered research

he Department of Research & Evaluation hosted 2 conferences that stretched the frontiers of health care in 2019. One focused on turning data into research with an impact on clinical practice. The other focused on improving health system-based embedded research programs.

"As an organization, we are on the forefront of conducting research to directly benefit our patients," said Steven J. Jacobsen, MD, PhD, senior director of research for Kaiser Permanente Southern California. "We have an obligation to share our experiences as a learning health care system, which is one designed to develop new evidence as an integral part of patient care."

"These 2 conferences brought together others in the field to inspire innovative patient-centered research throughout the research community," Dr. Jacobsen added.

In September 2019, more than 275 people attended the 4-day American College of Epidemiology Annual Meeting in Pasadena. The theme of the meeting was "Real-World Epidemiologic Evidence in Policy and Practice." It was one of the best-attended conferences in the recent history of ACE. "What we wanted was to get participants to think beyond just getting that grant and publishing that paper," said Dr. Jacobsen, who was elected by his peers as president-elect of ACE during the conference. "We really wanted to promote the relevance of research to public policy and clinical practice."

The conference concluded with a keynote address by Anne Schuchat, MD, the principal deputy director of the Centers for Disease Control and Prevention. She illustrated the importance of epidemiologic studies in shaping public policy with specific examples such as measles outbreaks, human papillomavirus (HPV) vaccination rates, and HIV prevention.

Earlier in the year, in February, more than 100 leaders and experts in the learning health care systems movement met for "Accelerating the Development of Learning Healthcare Systems Through Embedded Research."

The intent of the expert meeting was to grow and improve programs with research embedded into clinical practice, said Michael K. Gould, MD, MS, the director of R&E's Division of Health Services Research & Implementation Science.

Dr. Gould told attendees that, by embedding researchers in their health care systems, organizations like Kaiser Permanente can make continuous improvements in the quality, safety, and value of patient care. At the same time, they contribute to scientific knowledge nationally and globally.

The conference was co-hosted by AcademyHealth. It was funded by the Agency for Healthcare Research and Quality, Patient-Centered Outcomes Research Institute, and the Department of Veterans Affairs Health Services Research & Development Service.

American College of Epidemiology (ACE) Theme: Real-World Epidemiologic Evidence in Policy and Practice



Accelerating the Development of Learning Healthcare Systems Through Embedded Research



Oncologists as clinical trials investigators



Dr. Han Koh

R eceiving a cancer diagnosis can be a terrifying moment for a patient. But when patients at Kaiser Permanente Southern California see a physician for cancer, they can take comfort knowing they are also seeing a clinician researcher who can help them access the latest tools being studied for fighting the disease.

"We are an integrated health care system, and our clinical trials are integrated into that system," said William J. Towner, MD, FACP, FIDSA, regional physician director for the Department of Research & Evaluation's Division of Clinical Trials Research. "So, in other words, if you are diagnosed with a malignancy and you go in and see your oncologist, that same oncologist has access to many clinical trial options should you qualify for them."

There are typically about 50 active clinical trials available through the Cancer Clinical Trials Access Program. "Participation in clinical trials can give our patients access to medications that they wouldn't otherwise have been able to get," Dr. Towner said. "They also have the opportunity to be part of the medical discovery process while receiving first-rate Kaiser Permanente health care."

As a result of Kaiser Permanente's integrated model, all the 80 KPSC medical oncologists are also co-investigators on clinical trials research. Four of the principal investigators have overall responsibility for the cancer clinical trials: Gary L. Buchschacher Jr., MD, PhD; Lara Durna, MD, MS; Han A. Koh, MD; and Helen Moon, MD.

Dr. Koh explained that cancer treatment is evolving from treating all cancers with basically the same tools of chemotherapy and radiation into targeting specific cancers. Parts of that evolution are the clinical trials that show whether a treatment is safe and effective. KPSC has clinical trials in both targeted therapy and immunotherapy. Immunotherapy helps a patient's immune system fight cancer. Targeted therapy is a type of precision medicine that attempts to target the cancer's specific genes, proteins, or the tissue environment that contributes to cancer growth and survival.

These are the stories of who the principal investigators are, what inspires them, and why they were drawn to medicine and cancer research.

Gary L. Buchschacher Jr., MD, PhD

Los Angeles Medical Center Cancer specialty: Gastrointestinal cancer



Dr. Buchschacher grew up in northern Wisconsin and developed an interest in science as a child exploring the outdoors.

"I was always checking things out: animals, plants, insects–all of the things we would come across

in the outdoors—exploring was a big part of our playing," he said. "I was particularly interested in how a caterpillar could grow and transform into a monarch butterfly."

When he was in junior high and high school, he became interested in chemistry and molecular biology.

His fascination with science continued into college, where he became interested in the molecular biology behind cell functions. While he was working toward his undergraduate and graduate degrees at the University of Wisconsin-Madison, he also worked at the McArdle Laboratory for Cancer Research

"When I was studying molecular biology during undergrad and graduate school, my main interest was in the study of viral replication and the development of viral vectors (which are tools used to deliver genetic material into cells)," Dr. Buchschacher explained. "Basically, I was interested in determining how viruses might



Dr. Helen Moon, Dr. Jonathan Polikoff, Dr. Han Koh

be used as vectors to introduce genes, and the potential for gene transfer therapy applications."

That research translated directly into the precision medicine trials he works on today.

His typical workweek includes direct patient care as well as seeking out new potential trials that might be opened as part of the cancer clinical trials program.

"I'm always looking for opportunities for clinical trials in which we might be interested in participating," he said, "or discussing and participating in the development of trials."

Dr. Buchschacher, who specializes in gastrointestinal malignancies, said that he looks for trials targeted at specific cancer characteristics that some of his patients may share.

"In the past, before the science was able to identify potential treatment targets as readily, clinical trials were a bit more broadly designed," he said. "Now, with the advancements in molecular biology and molecular genetics, when it is possible to identify certain genetic defects or other specific characteristics of cancer cells, sometimes it can open up possibilities for treatments that can be targeted to those particular defects." In the last few years there has been significant progress and there is the potential for the development of new targeted therapies, Dr. Buchschacher said. Much progress has been made regarding treatments for melanoma, lung cancer, breast cancer, and some cancers of the blood.

"While there are now a variety of new treatments that have helped many people, precision cancer therapy isn't quite the panacea that people sometimes make it out to be," he said. "There are still many limitations, as well. We still have a lot of research and work to do, which is why it is important to have a robust cancer clinical trials program."

Lara Durna, MD, MS

South Bay Medical Center (Harbor City) Cancer specialties: Hematology and breast cancer



In college, Dr. Durna focused on plant biochemistry. While studying plants, she met an HIV researcher whose work inspired her to learn about medical biochemistry. She began a school internship at a drug company working on cancer pathways, and

she thought she had found her field. She was pursuing her PhD when a statistician introduced her to the world of clinical trials.

"I changed my mind after that and decided that I really wanted to get an MD, because I was interested in trying to help people with these cancers through cancer drug development," Dr. Durna said.

So, despite being a natural introvert who thought she would always be working in a lab, she changed her career trajectory.

"Once I started getting exposed to people as patients, I learned I really loved working with patients, and cancer patients, specifically," she said. "I felt like all of my background came together to have more meaning when I was looking across the



Dr. Gary Buchschacher, Dr. Lara Durna, Dr. Helen Moon

room at a human being that I could really help."

Dr. Durna said she has great hope for the advancement of cancer treatment through clinical trials.

"Because of my biochemistry background, it's always been clear to me that there's much more science to know than we currently do," she said. "There are far too many people who still die of this disease far too young."

She said she is driven to utilize science advancements to improve cancer therapies, "so people can go on living their lives, as fully as possible."

When available, targeted precision cancer treatments can have a lot of advantages, she said. Often, they can decrease the side effects that people are having while they're undergoing cancer treatment.

"Ultimately, these therapies have led to more people being cured of some diseases," Dr. Durna said, "and we hope in the future, to cure even more."

Han A. Koh, MD

Downey Medical Center Cancer specialty: Lung cancer



Dr. Koh was introduced to medicine at an early age: His grandfather and father were both physicians. What drew him to medicine, though, was an intense fascination with science that began in elementary school, he said.

"I wanted to be a scientist, and particularly a practical scientist, where the scientific knowledge could actually be used to help other people," Dr. Koh said. "So, that's how I ended up in medicine."

About 10 years ago, he was working as an oncologist at the Downey Medical Center doing chemotherapy clinical trials and research–when he was introduced to precision medicine.

"As I witnessed the development of precision medicine in the oncology area, I came to see that this was the future," he said. "I knew that this is where we would have to concentrate our research efforts, and that's exactly what's happening now."

Initially, he thought that precision medicine might be the "magic bullet" for curing cancer, "but as you do more research in the area, it's not that simple. There are a lot more barriers we have to overcome."

So, Dr. Koh and the other oncologists continue to do research to better understand how the different cancer-causing genes work. He's seen cases where they target one cancer-causing gene only to have the target mutate and another target pop up.

"I always say cancer cells are smarter than doctors," he said.

He said lung cancer, which he specializes in, is a good example of a cancer for which precision medicine can be helpful.

"Precision medicine can contribute a lot because lung cancer is not a single cancer," Dr. Koh said. "There are probably at least 50 or 60 different subtypes, so it's an ideal area for developing the targeted therapy."

He said one of the main trials is the STRATA trial, in which researchers are conducting "next-generation gene sequencing on the tumor cells," that allows them to identify the genetic aberration causing a cancer and to try to target that specific cancer.

Helen Moon, MD

Riverside Medical Center Cancer specialties: Genito-urinary cancer, melanoma, and immuno-oncology



As a young person, Dr. Moon wanted to become an international diplomat. But instead she followed a boyfriend to medical school. While it didn't work out with the boyfriend, it did turn out to be one of the best decisions of her life.

She realized helping to make people healthy was her calling, and one of her strongest motivators was the desire to not let people down. It was the perfect combination for a physician researcher, who could continually work to find new possible treatments.

"After I joined Kaiser Permanente, that's when I became really excited by the possibilities to do research," she said.

In the last 5 years or so, precision medicine has been making a big difference in her area of cancer, which are cancers of the urinary and male genital tract.

"So, in some ways, I was in the right place at the right time for the right specialty," she said.

Overall, she said the oncologist's job hasn't changed all that much. Most of it is about reassuring patients and helping them through difficult and uncertain times using the best treatments available.



(From left) Joseph Rosales, assistant manager ambulatory care nurse; Dr. David Wu, sub-investigator; Dr. Sunil Patel, subinvestigator; Dr. Han Koh, principal investigator; Maria Arriola, clinical research nurse; Susan Nottmeier, clinical trials nurse manager; Derek Bucheli, clinical research associate; Deborah Shipley, clinical research nurse; Nikki Williams, regulatory specialist; Dr. William Towner, regional physician director of clinical trials; Denise Martinez, clinical trials nurse manager; Dr. Wanping Hu, sub-investigator; Lorena Bacon, clinical research associate; and Dr. Fengyu Shu, sub-investigator

"For Gary, Lara, Han, and I, we have roles, not only in research, but also as physicians and regional cancer leadership," she said. "And so, you think about how to move the whole field forward, but also, what can we do for each of our patients?"

Dr. Moon said the role that Kaiser Permanente plays is critical to learning about new therapies and helping cancer patients get their best treatments. She called it the "concept of the last mile."

Often drugs and therapies can be developed that have incredible potential. But if the side effects are too unpleasant, patients won't continue with them and won't see the benefits. Kaiser Permanente's clinical trials are done typically in the stage where the treatment already has been shown to be safe for patients, but before it is available to the public. The Kaiser Permanente data show how the treatment works for large, diverse groups of people.

"Are patients able to afford the medications that we're giving them? Are they understanding that, even if it's a pill, it has side effects? Can we effectively manage nausea, so they don't throw away the pill?" she said. "We are able to optimize those pieces of the puzzle so all of that research into new medications can be relevant."

The cancer clinical trials space that she, Dr. Buchschacher, Dr. Durna, and Dr. Koh are involved in is exciting because it is constantly growing as they search out new opportunities and treatments for patients, she said.

"Oncology clinical trials will lead Kaiser Permanente into the next frontier," she said. "And we're all just hungering for more."



ACCOMPLISHMENTS & MILESTONES

Selected grants and contracts

Our scientists and clinician researchers lead studies that have potential to change practice well beyond the walls of our organization. Many studies receive external funding from federal agencies and non-governmental organizations. The following is a small sample of newly funded projects that will address important public health questions.

Predicting early-stage pancreatic cancer

Principal investigator: Bechien U. Wu, MD, MPH Funder: National Institutes of Health/National Cancer Institute

Pancreatic cancer is the fourth-leading cause of cancer death in the United States. One reason for this high death rate is that most pancreatic

cancer is detected at a very late stage. Effective strategies for early detection don't exist. As a result, most patients are diagnosed only after signs or symptoms have developed. The goal of this study is to develop



a method for identifying patients with potential features of pancreatic cancer much sooner by using clues from their electronic health record.

Kaiser Permanente Southern California researchers propose to address this task by applying artificial intelligence to KPSC's vast electronic data. They will use machine learning to develop algorithms that can identify patients in real time who are at increased risk for pancreatic cancer.

Computed tomography and magnetic resonance imaging are the mainstay for the initial diagnosis and staging of pancreatic cancer. The multidisciplinary team of researchers will also apply machine learning to radiographic images to develop an imaging-based signature for detection of early pancreatic cancer.

The feasibility of this algorithm-based approach to early detection will then be tested in a prospective cohort study, a type of study in which patients are identified and then followed up over time. The study will recruit patients with a predicted 18-month risk of pancreatic cancer over 5% to participate. These findings will then be used to further refine and adapt the prediction models for real-world application.

Air pollution and pregnancy complications

Principal investigators: Jean M. Lawrence, ScD, MPH, MSSA (KPSC); and Jun Wu, PhD, MPH (UC Irvine)

Funder: National Institute of Environmental Health and Safety

Complications during pregnancy, such as gestational diabetes, hypertension (high blood pressure), preeclampsia (high blood pressure and signs of liver or kidney damage), and eclampsia (seizures in a woman with preeclampsia), are major causes of maternal and infant morbidity and mortality. Studies have begun to look at how air pollution might affect which women develop these complications. Previous studies of this topic had major limitations, such as missing information on the mother's residential address, a focus on individual air pollutants instead of mixtures, and failure to address maternal characteristics like age, race, and ethnicity.

Researchers from KPSC and the University of California, Irvine, will collaborate to address these limitations, They will use state-of-the-art modeling and statistical methods to study the effect of exposure to air



pollution on pregnancy complications and birth outcomes in over 400,000 pregnancies over a 10year period in 8 Southern California counties. The researchers will extract routinely collected clinical

Selected grants and contracts | continued

information from electronic health records and maternal residential addresses from health system membership records.

The study seeks to answer whether exposure to different air pollution mixtures differentially affects risk for gestational diabetes, hypertension, and preeclampsia and eclampsia. The researchers will evaluate the effects of factors like the mothers' socioeconomic status, health conditions before pregnancy, asthma or respiratory infections during pregnancy, physical activity, weather, and even characteristics of the surrounding environment like walkability and noise.

Identifying modifiable risk factors in the environment and subpopulations at high risk may allow researchers to design targeted interventions in the future.

Cesarean delivery and body weight in children

Principal investigator: Corinna Koebnick, PhD, MSc

Funder: Centers for Disease Control and Prevention

Preventive antibiotics are recommended during labor and birth to prevent newborns from infection with group B streptococcus (GBS). This guidance has led to a more than 80% decline in GBS infection.



In 2017 the CDC issued a contract to explore several gaps in knowledge about how exposure to antibiotics from before birth through age 5 years affects the risk for childhood weight gain and obesity. Some strengths of the analyses conducted were the large sample size (more than 200,000 children) and the high quality of the data collected. That study found a small but significant association between the antibiotics given to prevent GBS infection and increased childhood weight gain, especially when children were delivered by cesarean.

This study by KPSC researchers aims to provide more information on the effects of onset of labor and rupture of membranes and how they interact with the exposure to antibiotics.

By studying the effects of labor onset and rupture of membranes during cesarean delivery at the same time as the effects of antibiotics on weight gain in the same population previously studied and with adjustment for the same variables, researchers can gain needed insight to guide public health policy.

Without this comparison, there is a risk that the previous findings could lead to hesitancy around antibiotic use and reverse the progress made in preventing GBS infection.

Increasing physical activity in adults with diabetes

Principal investigator: Deborah Rohm Young, PhD, MBA

Funder: National Institute of Diabetes and Digestive and Kidney Diseases

In patients with diabetes, regular physical activity improves glucose control and can induce disease remission. But only 5% of American adults meet national guidelines for physical activity. Primary care providers can play an important role in promoting physical activity.

This study builds on an existing innovation within Kaiser Permanente in which physical activity is assessed at every outpatient visit. In

this trial, primary care providers will determine whether it is safe for a patient to increase their physical activity, provide brief advice, and refer the patient to health coaching or community programs



Selected grants and contracts | continued

as appropriate. Eligible patients will be recruited to a 2-year intervention in which they receive counseling by phone or continue to receive usual care. The trial will focus on adults with prediabetes or diabetes who are not prescribed insulin because of their high risk for cardiometabolic complications and the great benefits they can obtain from regular physical activity.

Researchers will measure whether patients in the intervention increase their amount of moderateto-vigorous physical activity (as assessed by accelerometry) and whether their body mass index, hemoglobin A1C, blood pressure, lipids, and quality of life improve. The researchers will also study the cost-effectiveness of the intervention.

The long-term goal is to determine if this type of intervention can be successfully integrated into primary care. If so, millions of sedentary patients with diabetes or prediabetes could be effectively identified and referred to receive personal advice and physical activity counseling.

Bariatric surgery in racial and ethnic minority patients

Principal investigator: Karen J. Coleman, PhD, MS

Funder: National Institute of Diabetes and Digestive and Kidney Diseases



Rates of severe obesity-a body mass index greater than 35 kg/m2–are as high as 36% in middle-aged, non-Hispanic black women in the United States. That is compared with 16% in white women of the same age range. Lifestyle interventions have not proven successful for long-term weight loss, which has led to the development of surgical treatments for severe obesity. Bariatric surgery results in greater weight loss than diet and exercise over 24 months.

Research is lacking on weight-loss outcomes after surgery in racial and ethnic minority patients. The

evidence we do have suggests that black patients consistently lose less weight than white patients. In some studies, Hispanic patients were reported to lose more weight than non-Hispanic black and white patients. In other studies, Hispanic patients were reported to lose less weight.

This study aims to address existing gaps in the evidence. It will extend previous work done during the Bariatric Experience Long-Term (BELONG) study. The patients (n = 1,975) in BELONG are 41% Hispanic, 17% non-Hispanic black, and 37% non-Hispanic white. The proposed study will focus on weight regain during the 3 to 5 years after surgery, the critical period for maintaining weight loss.

The researchers will use innovative qualitative methods to better understand the patient experience. They will also measure how personal characteristics like coping styles and internalized racism contribute to health disparities in weight loss.

The findings can be applied to plan culturally appropriate postoperative care so that all patients can achieve the best benefits from weight-loss surgery.

Air pollution and risk of autism

Principal investigator: Anny H. Xiang, PhD, MS

Funder: National Institute of Environmental Health Sciences

In human and animal studies investigating the causes of autism spectrum disorder (ASD), evidence has converged on air pollution. Researchers from KPSC previously reported an association between exposure before birth to

fine particles in the air (particulate matter, or PM), and a higher risk for ASD. The researchers showed that male children who are exposed to PM of less than 2.5 micrometers in



Selected grants and contracts | continued

diameter before birth are more likely to develop ASD.

Exposure to ultrafine PM (less than 0.1 micrometers in diameter) has not been studied in humans. There also have been no methods to study the components of the complex PM mixture.

In this study, KPSC researchers will use new methods to measure historical concentrations of PM at addresses across California. In a cohort of 400,000 mother-child pairs, they will study associations of exposure to PM of 2.5 and 0.1 micrometers in diameter with the incidence of ASD.

ASD and other neuropsychiatric diseases have also been associated with medical conditions of the mother during pregnancy, including bacterial infections, asthma, obesity, and diabetes. Activation of the mother's immune system during pregnancy may be a common mechanism linking these maternal comorbidities and ASD. Whether this is the case has not yet been studied. Thus, another aim of this study is to see whether exposure to PM increases the risk for ASD by interacting with pathways related to activation of the mother's immune system.

The study will provide clues to the biological pathways underlying the effects of PM on ASD.

Early-life programming for obesity and diabetes

Principal investigators: Kathleen Page, MD (USC), and Anny H. Xiang, PhD, MS (KPSC)

Funder: National Institute of Diabetes and Digestive and Kidney Diseases

More than 35% of US adults and 17% of children have obesity, and the prevalence of type 2 diabetes in youth has risen by 30% over the past decade. Children exposed to obesity or gestational diabetes (GDM) before birth are at high risk of developing obesity and type 2 diabetes themselves. Why this is the case is not fully understood. Studies in animals suggest that exposure to maternal obesity or GDM before birth leads appetite pathways in the brain to develop abnormally. This hypothesis has not been studied before in humans.



In a collaborative study

between the University of Southern California and KPSC, researchers will test the hypothesis in children using functional and structural magnetic resonance imaging. The children will be enrolled at ages 7 to 10 years, a critical period of growth and brain development. The researchers aim to enroll 250 children, providing a large enough sample size to address the effects of maternalfetal programming on the pathways in the brain involved in energy balance.

One aim is to measure how exposure to maternal obesity and GDM affects the response of the hypothalamus to glucose. The hypothalamus plays a key role in regulating appetite and food intake. Another aim is to study effects on the connectivity of neural circuits in the brain involved in energy balance.

The study findings could help to target children at highest risk with therapies to prevent obesity and diabetes.

Selected findings

In 2019, Kaiser Permanente Southern California scientists and clinician researchers made important findings in a variety of research areas. The following is a small sample of some of these discoveries.



Chronic hyponatremia and risk for osteoporosis

Chronic hyponatremia, or a low concentration of sodium in the blood, may contribute to reduced bone density. Chronic hyponatremia can be caused by abnormal antidiuretic hormone secretion, medications, kidney diseases, and heart failure. In this study of over 340,000 men and women ages 55 years and older in Kaiser Permanente Southern California, researchers analyzed the association between hyponatremia and osteoporosis. Hyponatremia was defined as a serum sodium value <135 mEq/L and osteoporosis was measured by using dual-energy X-ray absorptiometry. The researchers found that people with chronic hyponatremia were approximately 11% more likely to have osteoporosis. They also noted that people with higher sodium levels had a lower risk for osteoporosis. Hyponatremia may be a modifiable risk factor for osteoporosis. This may set the stage for studies to determine targeted interventions.

Adams AL et al. Osteoporos Int. 2019 Apr;30(4):853-861.

Reoperation after midurethral sling surgery for stress urinary incontinence

The midurethral sling is a minimally invasive surgery for stress urinary incontinence, or leakage of urine with physical activity. However, concerns have been raised about adverse events related to the synthetic mesh used. To gather more long-term data on safety and effectiveness, researchers measured how many of KPSC's members underwent a repeat operation for either continued incontinence or problems related to the procedure more than 5 years after this surgery. In over 17,000 patients, the overall rate of reoperation was 6%. The rate of reoperation for mesh revision or removal was 1.1%. These types of data help surgeons and patients make more-informed decisions by adding to the evidence base for longterm safety and effectiveness.

Berger AA et al. Obstet Gynecol. 2019 Nov; 134(5): 1047-1055.

Diagnosing urinary tract infections in an era of expanding virtual care

Urinary tract infections are common and are a leading cause of antibiotic prescription. In this study, KPSC researchers analyzed 10 years of data from electronic health records to learn how the diagnosis of UTIs outside the hospital has changed in the era of virtual health care delivery (care provided by phone, video, or the internet). They found that UTI diagnoses with an antibiotic prescription increased 20% yearly between 2008 and 2017 in virtual visits, in which culture orders were uncommon. Rates of UTI were highest in older adults. These data highlight the need to develop strategies to ensure that UTIs are diagnosed accurately and to reduce inappropriate antibiotic treatment.

Bruxvoort KJ et al. Clin Infect Dis. 2019 Aug 22. pii: ciz764

Following up on abnormal laboratory results

What factors influence how long it takes for followup of abnormal laboratory results? Do electronic health records or patient portals facilitate timely follow-up? To answer these questions, KPSC researchers studied repeat testing after an initial abnormal result for estimated glomerular filtration rate (eGFR), a measure of how well the kidneys are functioning. Repeat abnormal eGFR results can signal chronic kidney disease. More than half of almost 245,000 patients with an initial abnormal eGFR result experienced a care gap in timely follow-up testing. Physicians reported challenges in managing laboratory test results within the EHR. Patient portal use was only weakly associated with follow-up testing. Improving how abnormal results are flagged in the EHR and boosting patient engagement may improve follow-up.

Danforth KN et al. Am J Kidney Dis. 2019 Nov;74:589-600.



Dr. Hung Fu Tseng and Dr. Katia Bruxvoort

Health of young adults before and after the Affordable Care Act

Passage of the Affordable Care Act (ACA) in 2010 expanded health care access to many young adults. Researchers at KPSC used electronic health record information to compare the health of young adults ages 18 to 25 years enrolled in the KPSC health plan before (2008-2010) and after (2010-2015) ACA passage. The number of young adults enrolled in the health plan increased by 65% during the time period studied, but prevalences of obesity and other health conditions were essentially unchanged. Future topics of study include whether these young adults retain their health insurance coverage after turning 26 and being removed from their parents' insurance plans. These data provide important information for reconsideration of the ACA.

Gervacio GB et al. Perm J. 2019;23:17-223.

Selected findings | continued



From left: Dr. Claudia Nau, Andrea Jones, Felica Jones, Ericka Wright, and Anthony Brown

How trustworthy are online physician ratings?

To answer this, researchers compared online ratings for almost 4,200 KPSC physicians with ratings for the same physicians compiled internally. They found that the correlation (a statistical description for the strength of an association) between the ratings was poor. Whereas the internal ratings were based on an average of 119 reviews from patients, the online ratings were calculated from an average of only 3.5 reviews. Only after a physician had accumulated 15 or more reviews online did the 2 ratings begin to align. Websites should consider waiting to post reviews until at least 15 patients have reviewed any one physician. These data suggest that consumers should consider the limitation of online ratings systems, which may not accurately reflect their doctor's quality.

Okike K et al. J Gen Intern Med. 2019 Nov;34(11):2575-2579.

Screening for patients' social needs by phone

Unmet social needs, such as food and housing insecurity, influence patients' health and use of health care services. Screening programs can identify patients with social needs and connect them with services. Working with the nonprofit organization Health Leads, KPSC researchers designed an intervention to provide screening and referral by phone for "high-utilizing" patients (those who used the most health care services). Over onehalf of those who agreed to screening reported a social need. Although the decline in health care utilization in the overall population who received the intervention was modest, the decline in patients with low socioeconomic status, including those with Medicaid coverage, was significant. The study findings showed that screening by phone is feasible and suggest that social needs programs are more likely to benefit patients from lowsocioeconomic status areas and those receiving Medicaid coverage.

Schickedanz A et al. J Gen Intern Med. 2019 Nov;34(11):2382-2389.

Using the HEART care pathway to evaluate patients with chest pain

Chest pain is the second most common reason people visit the emergency department. HEART (history, electrocardiography, age, risk factors, and troponin) is an objective risk score that helps clinicians decide which patients need further observation or testing in the hospital and which can be safely discharged. In this study, KPSC researchers compared hospital care and noninvasive stress testing before and after adoption of a HEART care pathway in the emergency departments of 13 KPSC community hospitals. After the HEART care pathway was put in place, fewer patients were hospitalized or referred for noninvasive stress testing. There was no significant difference in 30-day mortality or myocardial infarction. These findings suggest that use of a standard risk-stratification tool in the emergency department can safely reduce the use of hospital resources.

Sharp AL et al. Ann Emerg Med. 2019;74(2): 171-180.

Safety of influenza vaccines given in the hospital

Although the Centers for Disease Control and Prevention recommends that previously unvaccinated hospitalized patients receive a flu vaccine before discharge, adoption of this practice remains low. To address concerns of physicians and patients about safety, this study evaluated the safety of vaccinating hospitalized patients. The patients studied were ages 6 months or older and hospitalized in a Kaiser Permanente Southern California facility during 3 flu seasons. The researchers found no increase in risk for readmissions, outpatient visits, fever, or clinical evaluations for infection among patients vaccinated during their hospital stay compared with patients who were never vaccinated or were vaccinated at other times. However, only 28% of eligible patients were vaccinated before discharge. These data suggest it would be safe to include vaccination during hospitalization in strategies to help improve vaccination rates.

Tartof SY et al. Mayo Clin Proc. 2019 Mar;94(3):397-407.

Maternal characteristics affecting breastfeeding at 6 months

One of the objectives of Healthy People 2020 is to increase the number of U.S. infants breastfed at 6 months. Researchers studied trends in breastfeeding from 2008 to 2015 in relation to characteristics of mothers that may affect breastfeeding. Overall, the rate of breastfeeding at 6 months for more than 195,000 children born during the study period increased from 46% in 2008 to 72% in 2015. However, rates were not equal in different groups of women. Women with less than a college education, women younger than 25, and non-Hispanic black or Hispanic women had lower rates of breastfeeding during the study period and may benefit from targeted outreach programs to help reduce these disparities.

Xiang AH et al. J Pediatr. 2019 May;208:169-175. e2

For a full list of 2019 publications, please see the bibliography starting on page 54.

Research program overview

Investigators & Staff



INVESTIGATORS

Includes 36 full-time staff scientists plus clinical trials program leaders and affiliated researchers (retired and active physicians), and trainees (post-doctoral research fellows and Epidemic Intelligence Service officers).

Hundreds of physicians participate in research as collaborators and clinical trials investigators.

290

RESEARCH STAFF

Includes research project managers and research associates, clinical trials support staff, programmers, biostatisticians, and clinical informatics personnel.

95

SUPPORT STAFF

Includes division administration, business office, operations, research IT, and communications staff.

Projects & Publications 1,550



ACTIVE STUDIES

Throughout Kaiser Permanente Southern California. Includes internally and externally funded research projects and 380+ clinical trials.

400+

ORIGINAL RESEARCH PAPERS PUBLISHED

In medical and scientific journals. Excludes case reports, editorials, and letters.

Southern California Research Environment



FACILITIES

15 medical centers **234** medical offices

LAB & PHARMACY SERVICES

34.8 million outpatient prescriptions filled

50 million lab tests processed

PHYSICIANS & STAFF 7,600+ physicians 26,000+ nurses 74,000+ employees

SFX Southern California Member Population 51% Female 49% Male RACE/ETHNICITY AGES 20 years and younger 24% 43% Hispanic or Latino MEMBERSHIP RETENTION RATES 21 to 39 years 28% 35% White 83% remain with Kaiser Permanente more than 1 year MILLION **13%** Asian or Pacific Islander 40 to 64 years 33% MEMBERS 78% remain with Kaiser Permanente 65+ years 15% 8% Black or African American **1%** Other races remain with Kaiser Permanente after 5 years



Financial overview

Funding for research at Kaiser Permanente Southern California has increased in the past decade to support a growing portfolio of innovative and clinically relevant research.

Total research expenditures

\$72.97 million in 2019

Federal grants: \$21.9 million

Industry contracts: \$30.5 million

Kaiser Permanente provided the remaining funds. Internal funding sources included the Kaiser Permanente Community Health program, the Southern California Permanente Medical Group, the Sidney R. Garfield Memorial Fund, and the Center for Effectiveness & Safety Research.



2019 grants and awards

New grants and contracts awarded in 2019 will fund research at KPSC over a period of years.



2019 grant submissions (new grants only, excludes clinical trials)

Grants submitted Grants awarded

165

58



New grants and contracts (all years)

Direct costs Indirect costs **Total** \$5.6 million \$2.3 million **\$7.9 million**

Continued grants and contracts (all years)

Direct costs Indirect costs **Total** \$36.0 million \$29.1 million **\$65.1 million**



In 2019, Kaiser Permanente Southern California was the lead, or prime, institution for 69% of all the grants and contracts submitted, and was the subcontractor institution for the remaining 31%.

Projects funded by the Regional Research Committee

The Regional Research Committee awards funds from Kaiser Permanente's Community Health program for research projects led by clinicians and other health care professionals in Kaiser Permanente Southern California.

These projects address real-world clinical questions and have the potential to point to smarter ways to prevent and treat common health conditions. In 2019, the committee awarded funds to the following studies.

Anesthesiology

Retrospective evaluation of opioid-sparing analgesic regimen for perioperative pain control during tonsillectomy with and without adenoidectomy (T&A).

Principal investigator: Andrew G. Rudikoff, MD, Los Angeles

Cardiology

Development of electronic medical record-based risk stratification tool for congestive heart failure readmissions.

Principal investigator: Rabia Rafi Razi, MD, Los Angeles

Emergency Medicine

Early-phase resuscitation fluids in critically ill adults: Lactated ringers vs. normal saline.

Principal investigator: Nicholas J. Montano, MD, (resident physician), San Diego

Family Medicine

Adverse drug events associated with nortriptyline and paroxetine compared to alternative agents in an elderly population: a retrospective cohort study.

Principal investigator: Monique George, MD, Woodland Hills

Predictors of hepatitis A immunity in adults in order to better utilize hepatitis A vaccine.

Principal investigator: Bruno J. Lewin, MD, Los Angeles

Obstetrics-Gynecology

Postoperative quality outcomes after same-day discharge in gynecologic surgery.

Principal investigator: Shawn A. Menefee, MD, San Diego

Gender and racial microaggressions toward surgeons: the Kaiser Permanente experience.

Principal investigator: Emily L. Whitcomb, MD, Orange County

Ophthalmology

Assessing outcomes of a clinic-based vision screening program at Southern California Permanente Medical Group.

Principal investigator: Shaival S. Shah, MD, Orange County

Pediatric Endocrinology

Nine years of a secondary screening program for congenital hypothyroidism in high-risk neonates.

Principal investigator: Alan B. Cortez, MD, Orange County

Pediatrics

Effectiveness of the Orange County Pediatric Weight Management Program.

Principal investigator: Veronica Else, RN, PPCNP-BC, MSN, Orange County
Pediatric Hematology-Oncology

Comparison of cancer outcomes in Kaiser Permanente Southern California members and other privately insured patients.

Principal investigator: Robert M. Cooper, MD, Los Angeles

Plastic Surgery

Baseline characteristics of transgender patients seeking gender-affirming services: the Southern California Kaiser Permanente Transgender Cohort Study.

Principal investigator: Holly H. Kim, MD, West Los Angeles

Primary Care Sports Medicine / General Pediatrics

Socioeconomic and geographic differences in self-reported moderate-to-vigorous physical activity ("Exercise Vital Sign") in Kaiser Permanente Southern California members.

Principal investigator: John J. Tierney, MD, CAQSM, Los Angeles

Pulmonary, Critical Care Medicine

Exploring novel effects of different statins on ICU admission for sepsis.

Principal investigator: Kenneth Wei, MD, Los Angeles

Radiation Oncology

Cost-effectiveness analysis of stereotactic or highly conformal radiotherapy for treatment of oligometastatic cancers.

Principal investigator: Yushen Qian, MD, Los Angeles

Sleep Medicine

Using artificial intelligence to improve the triaging of patients with suspected sleep-disordered breathing into the proper sleep diagnostic testing pathway.

Principal investigator: Dennis Hwang, MD, San Bernardino County

Urology

Improving diagnostic accuracy and care quality for bladder cancer: a study to assess the frequency and variation in the use of restaging tumor resections.

Principal investigator: Philip H. Kim, MD, San Diego

RRC-GME Research Program Development Grant - Pilot Program

This type of grant is geared toward establishing sustainable research programs within graduate medical education to support GME faculty who want to lead and develop research programs on a topic of interest. The RRC funded the following studies in 2019.

Cardiology

Acute myocardial infarction associated with the use of prescription medications.

Principal investigator: Mingsum Lee, MD, Los Angeles

Nephrology

Polycystic kidney disease characteristics and comparative outcomes within a real-world environment.

Principal investigator: John J. Sim, MD, Los Angeles

Rapid-Cycle Research Grant - Pilot Program

This type of grant supports high-priority areas where practice-based research can help guide real-time clinical decision-making. They may evaluate existing care pathways or assess gaps in care that could lead to change in practice. A key component of rapid cycle research is the implementation of the proposed study findings. The RRC funded the following studies in 2019.

Endocrinology

Impact of inpatient diabetes control on length of stay (LOS) and readmission rates in Kaiser Permanente Southern California hospitals.

Principal investigator: Tish Villanueva, MD, Los Angeles

Hepatology

Pediatric NAFLD in Southern California.

Principal investigator: Amandeep Sahota, MD, Los Angeles

Surgery, General

Short-term outcomes after robotic colorectal surgery.

Principal investigator: Armen Aboulian, MD, Woodland Hills

2019 Regional Research Committee

Bechien U. Wu, MD, MPH, Chair, Regional Research Committee

Antelope Valley

Jonathan Truong, MD, Area Research Chair David Bronstein, MD, Vice Area Research Chair

Baldwin Park

Gaurav Khanna, MD, Area Research Chair Bobeck Modjtahedi, Vice Area Research Chair

Downey

Eugene A. Chu, MD, Area Research Chair Rajeev Attam, MD, Vice Area Research Chair

Fontana/San Bernardino

Robert E. Sallis, MD, Area Research Chair Steve S. Lee, DO, Vice Area Research Chair

Kern County

Michael J. Fassett, MD, Area Research Chair

Los Angeles

John J. Sim, MD, Area Research Chair Gary W. Chien, MD, Vice Area Research Chair

Orange County

Patrick J. Van Winkle, MD, Area Research Chair Emily L. Whitcomb, MD, Vice Area Research Chair

Panorama City

Shireen Fatemi, MD, Area Research Chair David Manela, MD, Vice Area Research Chair

Regional Laboratory

Darryl Palmer-Toy, MD, Area Research Chair

Riverside/Palm Springs

Rachid A. Elkoustaf, MD, Area Research Chair Vivienne S. Hau, MD, Vice Area Research Chair

San Diego

Shawn A. Menefee, MD, Area Research Chair Clifford J. Swap, MD, Vice Area Research Chair

South Bay

Bradley K. Ackerson, MD, Area Research Chair William W. Crawford, MD, Vice Area Research Chair

West Los Angeles

Michael J. Fassett, MD, Area Research Chair Daniel T. Lang, MD, Vice Area Research Chair

Woodland Hills

Lester D. Thompson, MD, Area Research Chair Armen Aboulian, MD, Vice Area Research Chair

Department of Research & Evaluation

Steven J. Jacobsen, MD, PhD, Area Research Chair

Deborah Rohm Young, PhD, MBA, Vice Area Research Chair

Stephanie Tovar, MS, Regional Research Committee Project Manager

INVESTIGATORS



"Our investigators come from many fields and partner with clinical collaborators from dozens of specialties and sub-specialties. Through these partnerships, we've built a research program that makes a difference in real-world health care."

- Steven J. Jacobsen, MD, PhD | Senior Director of Research
- Vaccine safety and effectiveness Chronic kidney disease • Men's urologic health
 - General chronic disease epidemiology
- Our research program includes 5 scientific divisions as well as affiliated researchers (see page 48).

Epidemiologic Research (page 41)

Our epidemiologists apply rigorous research methods to address important health questions that have the potential to change clinical practice and health care delivery. The division's research portfolio spans the care continuum, from etiology and prevention to survivorship and quality of life. Current research areas include cancer, cardiovascular disease, diabetes, infectious disease, molecular epidemiology, orthopedics and bone health, perinatal health, pharmacoepidemiology, and vaccines.

Behavioral Research (page 43)

Our behavioral scientists focus on research that has the potential to reduce disease risk by identifying modifiable risk factors and encouraging healthpromoting behaviors. Investigators have expertise in the following areas: adverse childhood experiences, cancer, chronic disease prevention and screening, diet and nutrition, mental health, obesity, physical activity, sedentary behavior, social determinants of health, and weight loss surgery and interventions.

Biostatistics Research (page 44)

Our collaborative biostatistician research scientists work closely with investigators in other scientific divisions, as well as physician researchers at medical centers across Kaiser Permanente Southern California. They provide expertise and guidance on study design, power and sample size calculations, data management, data analysis and interpretation, and statistical methodology.

Health Services Research & Implementation Science (page 45)

Investigators with the Division of Health Services Research & Implementation Science study how care is delivered, identify opportunities for care improvement, and implement new approaches for organizing and delivering health services. The division is home to the Care Improvement Research Team, which works closely with clinical and operational partners to identify, prioritize, and solve problems related to quality and affordability.

Clinical Trials Research (page 46)

The Division of Clinical Trials Research advances medical innovation by supporting evaluation of new drugs, therapies, and devices to prevent and treat health problems. Our physician investigators work with cooperative groups and industry sponsors to conduct clinical trials for investigational drugs, biologics, and devices. In addition, the division develops pragmatic trials that help answer questions about care delivery. See our clinical trials principal investigators by specialty on page 51.

Division of Epidemiologic Research

Research scientists



Kristi Reynolds, PhD, MPH

- Cardiovascular risk factors, treatment, and outcomes
- Chronic disease epidemiology
- Pharmacoepidemiology

Annette L. Adams, PhD, MPH

• Injury epidemiology

• Osteoporosis and bone health

• Quality of care

Director

Kim N. Danforth*, ScD, MPH

- Cancer epidemiology and prevention
- Ambulatory care safety and quality
- Health services and implementation research
- *Dr. Danforth left Kaiser Permanente in September 2019.

Darios Getahun, MD, PhD, MPH

- Women's and children's health
- Adverse pregnancy outcomes and health disparities
- Fetal origin of childhood diseases
- Risk for childhood asthma and neurodevelopmental diseases

Reina Haque, PhD, MPH

- Cancer epidemiology
- Cancer survivorship
- Pharmacoepidemiology

Rulin Hechter, MD, PhD, MS

- HIV and infectious disease epidemiology and health services research
- Substance abuse treatment and patient engagement
- PrEP uptake and adherence
- Vaccine uptake, safety, effectiveness

Jean M. Lawrence, ScD, MPH, MSSA

- Type 1 and type 2 diabetes in children and young adults
- Disparities in pregnancy complications and outcomes
- Perinatal mental health: diagnosis, treatment, and outcomes



Jaejin An, PhD

- Pharmacoepidemiology and comparative effectiveness research
- Medication adherence
- Cardiovascular risk factors, treatment, and outcomes



Chun Chao, PhD, MS

- HPV vaccine and cervical cancer prevention and screening
- Adolescent and young adult cancer and survivorship
- Etiology and prognosis of lymphoid malignancies
- Chemotherapy toxicity



Wansu Chen, PhD, MS

- Risk prediction using machine learning and statistical methods
- Pancreatic cancer; acute and chronic pancreatitis
- Asthma and chronic cough
- Atrial fibrillation











Division of Epidemiologic Research

continued



Sara Y. Tartof, PhD, MPH

- Infectious diseases
- Antibiotic resistance
- Hospital infections



Epidemic Intelligence Service officer

Lisa P. Oakley, PhD, MPH

- Maternal and child health
- Infectious disease
- Social epidemiology
- Health equity



Hung Fu Tseng, PhD, MPH

- Vaccine safety and effectiveness
- Real-world evidence
- Infectious diseases

Post-doctoral research fellows



Tracy A. Becerra-Culqui, PhD, MPH, OTR/L

- Early childhood health
- Child mental health
- Exposures during pregnancy
- Vaccine safety in pregnant women and children



Katia Bruxvoort, PhD, MPH

- Infectious diseases
- Vaccine safety and effectiveness
- Antimicrobial resistance
- Medication adherence



Matthew T. Mefford, PhD

- Cardiovascular disease
- Treatment, outcomes, and effectiveness
- Health disparities and equity
- Medication adherence

Division of Behavioral Research

Research scientists



Deborah Rohm Young, PhD, MBA Director

- Physical activity interventions in community settings
- Primary prevention of overweight and obesity
- Racial and ethnic health disparities



Claudia Nau, PhD

- Social determinants and patient social needs
- Obesity and obesity-related diseases
- Stakeholder engagement
- Predictive modeling

trauma

functioning



Karen J. Coleman*, PhD, MS

- Implementation research
- Mental health
- Health equity
- Weight loss surgery

* Dr. Coleman moved to Health Services Research & Implementation Science in Nov. 2019.





Corinna Koebnick, PhD, MSc

- Obesity and chronic disease epidemiology
- Health services research
- Primary care-based behavioral interventions
- Pediatric hypertension

Division of Biostatistics Research

Research scientists



Anny H. Xiang, PhD, MS

Director

- Biostatistics: design and analysis for clinical studies
- Diabetes, gestational diabetes, and obesity
- Pregnancy and women's and • children's health
- Racial and ethnic disparities



Jiaxiao Shi, PhD

- Nonparametric methodology
- Study design and data analysis
- Pharmaceuticals and breast cancer risk
- Chronic kidney disease, hypertension, and cardiovascular risk



Heidi Fischer, PhD

- Multilevel modeling
- Functional data analysis
- Observational data
- Biostatistics



Margo A. Sidell, ScD, MSPH

- Biostatistics
- Behavioral health
- Preventive care
- Social determinants of health



Lei Qian, PhD

- Statistical methods and study design
- Vaccine safety and effectiveness
- Cardiovascular risk factors, treatment, and outcomes



Jeff Slezak, MS

- Predictive modeling
- Prostate cancer
- Vaccine safety
- Bladder cancer



Ernest Shen*, PhD

- Biostatistics
- Structural equation modeling
- Robust statistics
- Health services research
- * Dr. Shen moved into another role in the department in Aug. 2019.



Hui Zhou, PhD, MS

- Biostatistical method and study design
- Risk prediction modeling
- Chronic kidney disease and endstage renal disease
- Cardiovascular disease

Division of Health Services Research & Implementation Science

Research scientists



Michael K. Gould, MD, MS

Director

- Lung cancer screening, diagnosis, and staging
- Venous thromboembolism
- Comparative effectiveness and outcomes research
- Implementation science



Stephen F. Derose*, MD, MSHS

- Sleep disorders and therapy
- Clinical epidemiology of chronic disease
- Health services research/ population health care
- * Dr. Derose left the department in Feb. 2019.



Aniket A. Kawatkar, PhD, MS

- Health economics
- Patient preferences
- Comparative effectiveness



Brian S. Mittman, PhD

- Implementation and improvement science
- Health care delivery science
- Complex interventions
- Learning health care systems



David Glass, PhD

- Global health
- End-of-life values and quality performance
- Primary care sustainability
- Episodes of care evaluation



Huong Q. Nguyen, PhD, RN

- Chronic disease self-management
- Care transitions
- Palliative care
- Implementation science



Erin E. Hahn, PhD, MPH

- Cancer care delivery research
- Cancer survivorship
- Dissemination and implementation science
- Delivery system science



Adam L. Sharp, MD, MSc

- Health services research, implementation science
- Health system science, emergency medicine
- Social determinants of health

Division of Clinical Trials Research

Portfolio principal investigators



William J. Towner, MD, FACP, FIDSA

Regional Physician Director

- HIV clinical trials
- Delivery of HIV pre-exposure prophylaxis
- Infectious disease vaccine safety and effectiveness



- Medical oncology
- Clinical trials
- Gastrointestinal cancers
- Gene therapy





Richard Green, MD

- Neuro-oncology
- Glioblastoma
- Central nervous system malignancies
- Primary CNS lymphoma
- Clinical trials

Nigel Gupta, MD

- Clinical cardiac electrophysiology
- Arrhythmia research and clinical trials
- Fellowship, teaching

Kelley Hodgkiss-Harlow, MD

- Critical limb ischemia
- Carotid disease
- Vascular access

Han A. Koh, MD

Lung cancer



Robert M. Cooper, MD

• Cancer clinical trials

Cancer outcomes



Lara Durna, MD, MS

- Medical oncology
- Hematology
- Hematologic cancers
- Breast cancer



• Benign hematology



Michael R. Girvigian, MD

- Benign and malignant tumors of the brain and spine
- Stereotactic radiotherapy procedures for precise targeting



Scott E. Lentz, MD, FACS

- Gynecologic oncology
- Hereditary cancer syndromes
- Surgical innovation



Shawn A. Menefee, MD

- Pelvic floor disorders
- Urinary incontinence
- Pelvic organ prolapse
- Urogynecologic surgery



Amandeep Sahota, MD

- Hepatitis B and C
- Fatty liver disease, nonalcoholic steatohepatitis (NASH)
- Liver transplant
- Biliary cholangitis

Ricardo T. Spielberger, MD

- Hematopoietic cell transplant
- Transplant side effects
- Opportunistic infections



Helen Moon, MD

- Genitourinary cancer
- Melanoma
- Immuno-oncology





Jonathan Polikoff, MD

- Breast cancer
- General oncology
- General hematology



Devansu Tewari*, MD, MBA

- Gynecologic oncology
- Health care economics, quality measurements
- Women's health cancer screening
- Surgical quality, timely access to cancer care
- * Dr. Tewari also participated in the Clinician Investigator Program in 2016-2017.



Firoozeh Sahebi, MD

Bone marrow transplant

Affiliated researchers

Affiliated investigators



Somjot S. Brar, MD, MPH

- Cardiovascular disease and risk factors
- Medical devices and interventional procedures
- Clinical trials and meta-analysis



Donald S. Fong, MD, MPH

- Retinal diseases
- Diabetic retinopathy
- Macular degeneration
- Ocular safety of systemic medications



Annette M. Langer-Gould, MD, PhD, MS

- Multiple sclerosis susceptibility and prognosis
- Comparative effectiveness of treatments for MS

Associate investigators



Sirichai Chayasirisobhon, MD, FAAN

• Epilepsy



Michael Kanter, MD

- Quality improvement
- Patient safety
- Patient engagement
- Models of care for chronic conditions



David A. Sacks, MD

Diabetes and pregnancy





Michael Schatz, MD, MS

- Asthma and pregnancy
- Asthma patient-reported outcomes
- Asthma population management
- Asthma quality measures

Robert S. Zeiger, MD, PhD

- Asthma, chronic obstructive pulmonary disease, cough
- Immunotherapy outcomes research
- Asthma clinical trials

Adjunct investigators

Dennis Black, PhD

- Osteoporosis
- Fracture risk
- Clinical trials

Kristen Choi, PhD, MS, RN

- Health services research
- Child behavioral health
- Trauma and violence
- Nursing

Paul Muntner, PhD

- Hypertension
- Lipids
- Cardiovascular disease
- Renal disease
- Epidemiology methods

Lauren P. Wallner, PhD, MPH

- Delivery and quality of adult cancer care
- Multilevel interventions to improve cancer care
- Cancer health services research
- Survivorship care











Clinician investigators

Current appointments



Kimberly Ferrante, MD, MAS

- Pelvic floor disorders in womenPrevention of recurrent urinary
- tract infections
- Treatment of vaginal atrophy



Chunyuan Qiu, MD, MS

- Anesthesiology
- Pain medicine
- Perioperative medicine

Joan J. Ryoo, MD, MSHS

- Radiation oncology
- Cancer care outcomes



Dennis Hwang, MD

- Health care delivery innovation
- Development of big data and machine learning tools
- Automation and population health management innovation
- Integration of medical and consumer health technologies



Mingsum Lee, MD, PhD

- Cardiovascular disease
- Medication adherence and drug safety
- Health care utilization and outcomes



Hui Xue*, MD, MMSc

- Dialysis outcomes
- Chronic kidney disease
- Renal transplant
- Bone mineral metabolism
- * Dr. Xue also participated in the Clinician Investigator Program in 2016-2017.



Bobeck S. Modjtahedi, MD

- Prediction analysis
- Population-based studies and care delivery
- Clinical outcomes analysis
- Telemedicine and e-health

Clinician investigators

Previous appointments



Raymond Chen, MD, DPhil

(2016–2017)

- Cardiac surgery
- Telemedicine
- Hospital readmissions



Emily L. Whitcomb, MD, MAS (2017–2018)

- Female pelvic floor disorders
- Quality metric development in urogynecology



Casey K. Ng, MD (2017–2018)

- Urology
- Hematuria
- Kidney stones
- Renal cysts
- Kidney cancer



Navdeep Sangha, MD

(2017–2018)

- Vascular neurology
- Ischemic stroke and intracerebral hemorrhage
- Hospital systems of care



John J. Sim, MD

(2016–2017)

- Resistant hypertension
- Glomerular diseases
- Polycystic kidney disease
- Chronic kidney disease epidemiology and outcomes



Bechien U. Wu, MD, MPH (2017–2018)

- Pancreatology
- Gastrointestinal cancer

Clinical trials principal investigators by specialty

Allergy

Michael Schatz, MD, MS, San Diego Medical Center Robert Zeiger, MD, PhD, San Diego Medical Center

Cardiology

Vicken Aharonian, MD, Los Angeles Medical Center Somjot S. Brar, MD, MPH, Los Angeles Medical Center Jeffrey Cavendish, MD, San Diego Medical Center Lei Feng, MD, Los Angeles Medical Center Nigel Gupta, MD, Los Angeles Medical Center William Keen, MD, San Diego Medical Center Naing Moore, MD, MRCP, FSCAI, Los Angeles Medical Center Jonathan Neyer, MD, Los Angeles Medical Center Morris Salem, MD, Los Angeles Medical Center Ray Zadegan, MD, Los Angeles Medical Center

Dermatology

Kim Chong, MD, Los Angeles Medical Center

Endocrinology

Patricia Wu, MD, San Diego Carmel Valley Medical Offices

Gastroenterology

John M. Iskander, MD, Los Angeles Medical Center Kevin Kao, MD, Downey Medical Center Suresh Pola, MD, San Diego Medical Center Bechien U. Wu, MD, MPH, Los Angeles Medical Center

Hepatology

Mamie Dong, MD, San Diego Medical Center Amandeep Sahota, MD, Los Angeles Medical Center

Infectious Diseases

Jim Nomura, MD, Los Angeles Medical Center William J. Towner, MD, FACP, FIDSA, Los Angeles Medical Center

Metabolic/Genetics

Divya Vats, MD, Los Angeles Medical Center

Nephrology

Victoria Kumar, MD, Los Angeles Medical Center Hui Xue, MD, MMSc, San Diego Medical Center

Neurology

Zahra Ajani, MD, Los Angeles Medical Center Sirichai Chayasirisobhon, MD, FAAN, Anaheim Kraemer Medical Offices Conrad Liang, MD, PhD, Fontana Medical Center Prasanth Manthena, MD, Los Angeles Medical Center William Neil, MD, San Diego Medical Center Navdeep Sangha, MD, Los Angeles Medical Center

Neurological Surgery

Harsimran S. Brara, MD, Los Angeles Medical Center Vaninder Chhabra, MD, Fontana Medical Center

Gynecologic Oncology

Scott E. Lentz, MD, FACS, Los Angeles Medical Center Devansu Tewari, MD, MBA, Irvine Medical Center, Alton/Sand Canyon Medical Offices

Hematology Oncology

Gary L. Buchschacher Jr., MD, PhD, Los Angeles Medical Center Lara Durna, MD, MS, South Bay Medical Center Han A. Koh, MD, Downey Medical Center Helen Moon, MD, Riverside Medical Center Jonathan Polikoff, MD, San Diego Medical Center

Neuro-Oncology

Richard Green, MD, Los Angeles Medical Center

Radiation Oncology

Michael R. Girvigian, MD, Los Angeles Medical Center

Clinical trials principal investigators by specialty

Surgical Oncology

Vikram Attaluri, MD, Los Angeles Medical Center Anna Leung, MD, Los Angeles Medical Center Elisabeth McLemore, MD, Los Angeles Medical Center

Ophthalmology

Michelle Britt, Irwindale Medical Offices Vivienne S. Hau, MD, Riverside Medical Center Damien Rodger, MD, PhD, Los Angeles Medical Center Kapil M. Sampat, DO, Riverside Medical Center Neil M. Vyas, MD, Panorama City Medical Center

Orthopedics

Gregory Maletis, MD, Baldwin Park Medical Center Anshuman Singh, MD, San Diego Medical Center

Pediatric Oncology

Robert M. Cooper, MD, Los Angeles Medical Center

Pediatric Orthopedics

Jeffrey Kessler, MD, Los Angeles Medical Center Jennifer Weiss, MD, Los Angeles Medical Center

Pediatric Pulmonology

Muhammad Saeed, MD, Los Angeles Medical Center

Pediatric Surgery

Donald Shaul, MD, Los Angeles Medical Center

Pulmonology

Mihran H. Garabedian, MD, FCCP, Los Angeles Medical Center Aung Htoo, MD, Kern County Jonathan Truong, MD, Antelope Valley Kenneth Wei, MD, Los Angeles Medical Center George Yuen, MD, Irvine Medical Center

Rheumatology

Steve S. Lee, DO, Fontana Medical Center

Sleep Medicine

Dennis Hwang, MD, Fontana Medical Center Prasanth Manthena, MD, Los Angeles Medical Center

Urology

Polina Reyblat, MD, Los Angeles Medical Center Eugene Rhee, MD, Otay Mesa Medical Offices Christopher Tenggardjaja, MD, Los Angeles Medical Center

Urology/Reproductive/Gynecological Disorders

Keisha Dyer, MD, San Diego Point Loma Medical Offices

Michelle E. Koski, MD, San Diego Medical Center

Karl Luber, MD, San Diego Medical Center

Shawn A. Menefee, MD, San Diego Point Loma Medical Offices

John Nguyen, MD, Downey Medical Center

Jasmine Tan-Kim, MD, San Diego Point Loma Medical Offices

Christopher Tenggardjaja, MD, Los Angeles Medical Center

Emily L. Whitcomb, MD, MAS, Irvine Medical Center

Vascular Surgery

Catherine Chang, MD, San Diego Medical Center Linda Chun, MD, Los Angeles Medical Center Kelley Hodgkiss-Harlow, MD, San Diego Medical Center Elena Rakhlin, MD, San Diego Medical Center

continued

P U B L I C A T I O N S

2019 Publications

Scientists, clinicians, and other health professionals from Kaiser Permanente Southern California authored original research papers on a wide range of topics in 2019, from allergy and asthma to women's health.

Allergy and Asthma

Bacharier LB, Covar RA, Haselkorn T, Iqbal A, Alvarez C, Mink DR, Chen H, Zeiger RS. Consistently very poorly controlled asthma is associated with greater activity and school impairment in children with severe or difficult-to-treat asthma. *J Allergy Clin Immunol Pract.* 2019 Jan;7(1):314-316.

Casale TB, Luskin AT, Busse W, Zeiger RS, Trzaskoma B, Yang M, Griffin NM, Chipps BE. Omalizumab effectiveness by biomarker status in patients with asthma: evidence from PROSPERO, a prospective real-world study. *J Allergy Clin Immunol Pract.* 2019 Jan;7(1):156-164.e1.

Chen W, Schatz M, Liang Z, Li Q, Sadikova E, Zhang Z, Bagga S, Zeiger RS. Controller therapy in Asians and whites with persistent asthma. *Asian Pac J Allergy Immunol*. 2019 Jun;37(2):73-86.

Chipps BE, Bacharier LB, Murphy KR, Lang D, Farrar JR, Rank M, Oppenheimer J, Zeiger RS. The asthma controller step-down yardstick. *Ann Allergy Asthma Immunol.* 2019 Mar;122(3):241-262.e4.

Cohen JM, Bateman BT, Huybrechts KF, Mogun H, Yland J, Schatz M, Wurst KE, Hernandez-Diaz S. Poorly controlled asthma during pregnancy remains common in the United States. *J Allergy Clin Immunol Pract.* 2019 Nov-Dec;7(8):2672-2680.e10.

Desai SH, Crawford WW, Sheikh J, Li ZQ, Chen W, Gong A, Vogel R, Schatz M. The HEDIS Medication management for people with asthma measure is not associated with improved asthma outcomes. *J Allergy Clin Immunol Pract.* 2019 Apr;7(4):1327-1329.e8.

Fitzpatrick AM, Bacharier LB, Guilbert TW, Jackson DJ, Szefler SJ, Beigelman A, Cabana MD, Covar R, Holguin F, Lemanske RF Jr, Martinez FD, Morgan W, Phipatanakul W, Pongracic JA, Zeiger RS, Mauger DT; NIH/NHLBI AsthmaNet. Phenotypes of recurrent wheezing in preschool children: identification by latent class analysis and utility in prediction of future exacerbation. *J Allergy Clin Immunol Pract.* 2019 Mar;7(3):915-924.e7. PMCID: PMC6401237

Flores KF, Bandoli G, Chambers CD, Schatz M, Palmsten K. Asthma prevalence among women aged 18 to 44 in the United States: National Health and Nutrition Examination Survey 2001-2016. *J Asthma*. Published online April 24, 2019. doi: 10.1080/02770903.2019.1602874 Jean T, Eng V, Sheikh J, Kaplan MS, Goldberg B, Jau Yang S, Samant S. Effect of omalizumab on outcomes in patients with aspirin-exacerbated respiratory disease. *Allergy Asthma Proc.* 2019 Sep;40(5): 316-320.

Lee-Sarwar K, Kelly RS, Lasky-Su J, Kachroo P, Zeiger RS, O'Connor GT, Sandel MT, Bacharier LB, Beigelman A, Laranjo N, Gold DR, Weiss ST, Litonjua AA. Dietary and plasma polyunsaturated fatty acids are inversely associated with asthma and atopy in early childhood. *J Allergy Clin Immunol Pract.* 2019 Feb;7(2):529-538.e8. PMCID: PMC6400588

Lee-Sarwar KA, Kelly RS, Lasky-Su J, Zeiger RS, O'Connor GT, Sandel MT, Bacharier LB, Beigelman A, Laranjo N, Gold DR, Weiss ST, Litonjua AA. Integrative analysis of the intestinal metabolome of childhood asthma. *J Allergy Clin Immunol.* 2019 Aug;144(2):442-454. PMCID: PMC6688902

Lee-Sarwar KA, Kelly RS, Lasky-Su J, Zeiger RS, O'Connor GT, Sandel MT, Bacharier LB, Beigelman A, Rifas-Shiman SL, Carey VJ, Harshfield BJ, Laranjo N, Gold DR, Weiss ST, Litonjua AA. Fecal short-chain fatty acids in pregnancy and offspring asthma and allergic outcomes. *J Allergy Clin Immunol Pract*. 2019 Mar;8(3):1100-1102.e13. PMCID: PMC7056490

Macy E, Yao JF, Chen W. Fatal asthma: an audit of 30 million patient-years of health plan membership from 2007 to 2015. *J Allergy Clin Immunol Pract*. 2019 Feb;7(2):597-605.

McDaniel CE, Jeske M, Sampayo EM, Liu P, Walls TA, Kaiser SV. Implementing pediatric asthma pathways in community hospitals: a national qualitative study. *J Hosp Med*. Published online September 18, 2019. doi: 10.12788/jhm.3296

Mirzakhani H, Carey VJ, McElrath TF, Hollis BW, O'Connor GT, Zeiger RS, Bacharier L, Litonjua AA, Weiss ST. Maternal asthma, preeclampsia and risk of childhood asthma at age six. *Am J Respir Crit Care Med*. 2019 Sep;200(5):638-642. PMCID: PMC6727151

Nyenhuis SM, Akkoyun E, Liu L, Schatz M, Casale TB. Real-world assessment of asthma control and severity in children, adolescents, and adults with asthma: relationships to care settings and comorbidities. *J Allergy Clin Immunol Pract*. Published online November 7, 2019. doi: https://doi.org/10.1016/ j.jaip.2019.10.032 Szefler SJ, Raphiou I, Zeiger RS, Stempel D, Kral K, Pascoe S. Seasonal variation in asthma exacerbations in the AUSTRI and VESTRI studies. *ERJ Open Res.* 2019 Apr;5(2). PMCID: PMC6507548

Vyles D, Macy E. Self-reported beta-lactam intolerance: not a class effect, dangerous to patients, and rarely allergy. *Expert Rev Anti Infect Ther*. 2019 Jun;17(6):429-435.

Zeiger RS, Schatz M, Yang SJ, Chen W. Fractional exhaled nitric oxide-assisted management of uncontrolled persistent asthma: a real-world prospective observational study. *Perm J.* 2019;23: 18-109. PMCID: PMC6499115

Bone Health and Orthopedics

Adams AL, Li BH, Bhandari S, Kamat S, Sundar S, Krasa H, Rhee CM, Kalantar-Zadeh K, Jacobsen SJ, Sim JJ. Chronic hyponatremia and association with osteoporosis among a large racially/ethnically diverse population. *Osteoporos Int*. 2019;30(4):853-861.

Bhandari SK, Adams AL, Li BH, Rhee CM, Sundar S, Krasa H, Danforth KN, Kanter MH, Kalantar-Zadeh K, Jacobsen SJ, Sim JJ. Sub-acute more than chronic hyponatremia is associated with serious falls and hip fractures. *Intern Med J*. Published online November 10, 2019. doi: 10.1111/imj.14684

Chughtai M, Shah NV, Sultan AA, Solow M, Tiberi JV, Mehran N, North T, Moskal JT, Newman JM, Samuel LT, Bhave A, Mont MA. The role of prehabilitation with a telerehabilitation system prior to total knee arthroplasty. *Ann Transl Med*. 2019 Feb;7(4):68. PMCID: PMC6409240

Dillon MT, Prentice HA, Burfeind WE, Chan PH, Navarro RA. The increasing role of reverse total shoulder arthroplasty in the treatment of proximal humerus fractures. *Injury*. 2019 Mar;50(3):676-680.

Haghverdian JC, Hsu JY, Harness NG. Complications of corrective osteotomies for extra-articular distal radius malunion. *J Hand Surg Am*. 2019 Nov;4(11): 987.e1-987.e9.

Heaps BM, Blevins JL, Chiu YF, Konopka JF, Patel SP, McLawhorn AS. Improving estimates of annual survival rates for medial unicompartmental knee arthroplasty, a meta-analysis. *J Arthroplasty*. 2019 Jul;34(7):1538-1545.

Hinman AD, Inacio MCS, Prentice HA, Kuo CC, Khatod M, Guppy KH, Paxton EW. Lumbar spine fusion patients see similar improvements in physical activity level to non-spine fusion patients following total hip arthroplasty. *J Arthroplasty*. Published online August 29, 2019. doi: 10.1016/j.arth.2019.08.053

Intravia J, Acevedo DC, Chung WJ, Mirzayan R. Complications of elbow arthroscopy in a community based practice. *Arthroscopy*. Published online November 27, 2019. doi: 10.1016/j.arthro.2019.11.108

Kramer JD, Chan PH, Prentice HA, Hatch J, Dillon MT, Navarro RA. Same-day discharge is not inferior to longer length of in-hospital stay for 90-day readmissions following shoulder arthroplasty. *J Shoulder Elbow Surg.* Published online December 9, 2019. doi: 10.1016/j.jse.2019.09.037

Kwon SS, Chazen JL, Kishore S, Habibi BA, Chi M, Rand E, Lowder R, Singh JR. Investigation of genicular neurotomy of the knee: MRI characterization of anatomy and implications for intervention. *Clin Imaging*. Published online November 9, 2019. doi: 10.1016/ j.clinimag.2019.09.006

LeBlanc ES, Rosales AG, Genant HK, Dell RM, Friess DM, Boardman DL, Santora AC, Bauer DC, de Papp AE, Black DM, Orwoll ES. Radiological criteria for atypical features of femur fractures: what we can learn when applied in a clinical study setting. *Osteoporos Int.* 2019 Jun;30(6):1287-1295.

Matcuk GR, Moin P, Cen S. Shoulder measurements on MRI: statistical analysis of patients without and with rotator cuff tears and predictive modeling. *Clin Anat*. Published online June 8, 2019. doi: 10.1002/ ca.23422

Mirzayan R, Andelman SM, Sethi PM, Baldino JB, Comer BJ, Obopilwe E, Morikawa D, Otto A, Mehl J, Murphy M, Mazzocca AD. Acellular dermal matrix augmentation significantly increases ultimate load to failure of pectoralis major tendon repair: a biomechanical study. *J Shoulder Elbow Surg*. Published online December 16, 2019. doi: 10.1016/ j.jse.2019.09.020

Navarro RA, Prentice HA, Inacio MCS, Wyatt R, Maletis GB. The association between race/ethnicity and revision following ACL reconstruction in a universally insured cohort. *J Bone Joint Surg Am*. 2019 Sep;101(17):1546-1553.

O'Shea R, Panwar J, Chu Kwan W, Stimec J, Camp MW, Gargan M. Establishing safe zones to avoid nerve injury in the approach to the humerus in pediatric patients: a magnetic resonance imaging study. *J Bone Joint Surg Am*. 2019 Dec;101(23):2101-2110. Paxton EW, Cafri G, Nemes S, Lorimer M, Kärrholm J, Malchau H, Graves SE, Namba RS, Rolfson O. An international comparison of THA patients, implants, techniques, and survivorship in Sweden, Australia, and the United States. *Acta Orthop*. 2019 Apr;90(2):148-152. PMCID: PMC6461092

Prentice HA, Chan PH, Dillon MT, Reddy NC, Navarro RA, Paxton EW. Lower-extremity total joint arthroplasty in shoulder arthroplasty patients: does the order of the lower-extremity total joint arthroplasty matter? *J Shoulder Elbow Surg*. Published online September 11, 2019. doi: 10.1016/j.jse.2019.07.002

Prentice HA, Inacio MCS, Singh A, Namba RS, Paxton EW. Preoperative risk factors for opioid utilization after total hip arthroplasty. *J Bone Joint Surg Am*. 2019 Sep;101(18):1670-1678.

Schubert MF, Thomas JR, Gagnier JJ, McCarthy CM, Lee JJ, Urquhart AG, Pour AE. The AAHKS Clinical Research Award: prophylactic tamsulosin does not reduce the risk of urinary retention following lower extremity arthroplasty: a double-blinded randomized controlled trial. *J Arthroplasty*. 2019 Jul;34(7S):S17-S23.

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