**FROM PROMISE TO PRACTICE**

TPMG’s Delivery Science and Applied Research portfolio translates physicians’ insights into better treatment and care for patients throughout Northern California.

**AN ABNORMAL NARROWING** of the carotid artery increases the risk of stroke. But surgery to restore healthy arterial blood flow carries its own risks. Modern anti-cholesterol drugs are another approach, but which strategy is the better option?

After treating many patients with potentially life-threatening carotid artery stenosis in his practice at South San Francisco Medical Center, vascular surgeon Robert Chang, MD, recognized that their large cache of electronic health records might allow him to tease out the benefits of one treatment over the other. Dr. Chang began collaborating in 2017 with a team of Division of Research (DOR) scientists, programmers, statisticians, and analysts to probe these records for answers. Their preliminary analysis of the data indicates that the stroke rate for patients with asymptomatic severe carotid artery stenosis is significantly lower than previously thought.

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Dr. Chang’s research is supported by the TPMG Delivery Science and Applied Research portfolio (DARE). His project fits DARE’s mission well: to support research that transforms insights gained in physicians’ practices into new treatment and care strategies. The program fuels collaborations between physicians and research colleagues, and seeks to quickly move promising ideas into practice.

“It’s not enough to generate new knowledge,” says Irene Chen, MD, TPMG associate executive director. “We must translate treatment insights into clinical operations as soon as possible to enhance our patients’ health. That’s what we mean by delivery science.”

If further analysis confirms Dr. Chang’s findings, the medical group will share this new evidence with TPMG physicians who treat carotid artery stenosis, so that each can consider incorporating the new research findings into their treatment decisions.

Like Dr. Chang, Betty Sub-Burgmann, MD, a gynecologic oncologist at Walnut Creek, is supported by DARE. Working with DOR analysts, she was able to standardize a system to evaluate the cancer risk of ovarian cysts.

“Each of our projects arose from our own practice,” Dr. Sub-Burgmann says. “As clinicians we are in a unique position to recognize where the gaps in knowledge are. We really want to identify those because they affect what we do every day with our patients.”

**A diverse portfolio**

Drs. Chang and Sub-Burgmann are supported by DARE’s Physician Researcher program, an initiative created in 2017 that provides substantial research project support to six TPMG clinicians so that they can devote 20 to 40 percent of their time to research for 4 years. This program is one of six within the Delivery Science and Applied Research portfolio.

Another of DARE’s key programs is the Rapid Analytics Unit (RAU) within the Division of Research, which also helped make possible Dr. Sub-Burgmann’s ovarian cyst research. Teams of RAU analysts, programmers, statisticians, project managers, and other experts collaborate with DARE-funded physicians to help evaluate promising research ideas and quickly move results into practice. The unit provides the technical expertise to gather and assess the data needed to establish the promise of a new diagnosis or treatment option. The possibilities for future projects are nearly endless. RAU programmers could design software and statistical strategies, for example, to examine patient records and determine outcomes of different treatments for a cardiac anomaly. They could develop a system to alert physicians to new evidence, or identify patients at higher risk of colon cancer and reach out to them for earlier screening—the “care delivery” in delivery science.

Overall, the TPMG delivery science effort has initiated about 70 research-to-practice projects since it was launched in 2012.

**The promise of delivery science**

TPMG has steadily increased its commitment to delivery science, and support has doubled since the program’s inception, says Tracy Lieu, MD, director of the Division of Research. She and Dr. Philip Madvig, who was TPMG associate executive director overseeing research before he retired last year, were key in establishing this commitment.

“The DARE portfolio of programs is very exciting,” Dr. Lieu says. “As it expands, and we give physicians throughout the medical group the right collaborative support, we can address important questions and make desired improvements in the way we deliver care.”

Originally named the Delivery Science program, the effort has been reorganized and expanded, and last year took on its current name, Delivery Science and Applied Research. At that time, Douglas Corley, MD, PhD, a gastroenterologist at the San Francisco Medical Center and DOR research scientist, was named its director, overseeing the expanding delivery science collaboration between TPMG and DOR.

About the challenges ahead, he says, “Everyone is interested in accelerating innovation and application of learning. It’s a matter of how to do it efficiently, rapidly, and at scale for many ideas across many specialties.

“We need to find new ways of supporting people to complete successful investigations and remove barriers for collaboration—that’s what I see as my main job.”

**Building bridges, developing networks**

When Dr. Corley assumed the role of directing DARE, he brought together TPMG’s clinical and research leadership, along with clinician researchers, DOR leaders, and analysts to determine any barriers to achieving their shared goals, as well as to identify areas primed for success.

Dr. Corley and the group pinpointed four key areas for development: identifying ideas that hold the potential to impact clinical outcomes, or improve patient and provider experiences; expanding the analytic infrastructure; increasing support for clinician researchers; and developing strategic collaborations to facilitate implementation.

DARE’s staff have wide-ranging expertise, from clinicians embedded in specialties to DOR analysts and project managers, as well as operations specialists—the people who really can move new medical practices into the clinic,” Dr. Corley says.

He’s particularly keen on developing specialty research networks. “We’re trying to create a climate in which specialists can build communities of investigators so that people are not

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**Specialty Research Networks**

Clinician-led networks create communities of clinician investigators who initiate, encourage, and enable collaborative research to improve outcomes, value, and patient and provider experiences.

**Delivery Science Research Program**

Funds medium-size projects of up to 2 years aimed at improving health care delivery, led by physician-researcher pairs.

**Rapid Analytics Unit**

A specialized research-analytics team that collaborates with physicians to evaluate promising applied research ideas that can be completed within 12 months; TPMG leadership prioritizes projects.

**Targeted Analysis Program**

Supports small projects that address questions of high value to quality leaders and researchers; projects primarily use existing data and are completed within 6 months.

**Physician Researcher Program**

Provides selected physicians with 20%–40% of support time over 4 years to projects designed to systematically evaluate questions and implement changes in clinical care.

**Fellowship Program**

Two-year, full-time program provides training for post-residency physicians and post-doctoral researchers to conduct research that drives into practice where care is delivered; contact Richard Grant, MD, or Julie Schmitttal, PhD.
Dr. Corley: “Everyone is interested in accelerating innovation and application of learning. It’s a matter of how to do it efficiently, rapidly, and at scale for many ideas across many specialties.”

Dr. Corley adds, “Centuries ago, many people traveled the world, but few widely shared their knowledge and experiences. Then people started collaborating, learning from each other, making maps of where to go, and how to get there. With the funding, technical support, and colleagues with whom physicians can take years to be implemented and produce actual improvements in medical care. The NIH simply doesn’t fund the more practical, short-turnaround research that can quickly improve how we deliver care on a day-to-day basis.”

“Biomedical research in this country is usually funded by the National Institutes of Health [NIH],” she says, “and support goes to research that is very rigorous. But insights can take years to be implemented and produce actual improvements in medical care. The NIH simply doesn’t fund the more practical, short-turnaround research that can quickly improve how we deliver care on a day-to-day basis.”

To this end, each of the six physicians in the first cohort of the Physician Researcher program comes from a different specialty. Three more physician researchers will be joining their ranks this year.

Locating the right support
To help physicians discover opportunities for research, find colleagues with similar interests, and get funding and support, Dr. Corley is creating several communications platforms. One is a website for the DARE portfolio that will have landing pages for each specialty network.

“The website will make it easier for physicians to connect within specialty networks,” he says. “It will serve as an organizing place to help a physician who might be thinking, ‘I’m interested in this idea. Is anyone else? Has anyone else carried out research on this? What resources are available? How do I apply for those?’ ”

His team is also developing a website to help physicians navigate to funding and support mechanisms.

“A year ago, all the sources for funding were in different places, under different administrative structures, so physicians sometimes had to fill out many applications just for one project,” Dr. Corley says. “We’re trying to bring them all together. For example, there is now a common initial application process to obtain research support from TPMG funding sources.”

He expects both websites to be live by the end of the year. Until then, interested physicians are encouraged to contact their local chairs of the TPMG Central Research Committee. DARE staff are working with the chairs to help physicians get to the right target for support. Interested physicians can also email Dr. Corley directly if they have questions.

As DARE grows, so does its support for the team of experts in the Rapid Analytics Unit who help DARE-funded physicians gather and assess data. DOR has added more RAU analysts, and Dr. Corley’s team has developed a more standardized application process for physicians who want to work with them.

“RAU has been absolutely essential in assessing promising research and getting it to the finish line,” Dr. Corley says.

Internal funding for fast results
Overall, the key element underlying our progress in delivery science has been internal funding, Dr. Liu says.

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TPMG’s internal funding differs from that of most university medical schools. Dr. Liu adds. Many universities have internally-funded, short-term research grants, but few fund rapid analytics units that can quickly move a research idea toward a clinical threshold, and few support research-to-clinic efforts at the scale of TPMG’s Physician Researcher program.

Dr. Chen says the size and caliber of TPMG—now over 9,000 physicians strong—and the DOR’s robust research support place KP Northern California in a unique position to advance specialty networks.”

“The DOR is one of the largest research facilities in the country outside university and government settings, and between TPMG clinicians and the DOR, we publish about three peer-reviewed journal articles per working day,” Dr. Chen says. “Who is in a position better than we are to evaluate the effectiveness of clinical practices and quickly improve patient care?”

Developing maps for success
For the past 7 years, Dr. Suh-Burgmann, now chair of the Northern California Central Research Committee and cochair of the Northern California Institutional Review Board, has seen her research and the Delivery Science program grow together.

She secured modest research support from KP Northern California in 2013 to create the first standardized system for categorizing ovarian cysts. When RAU was established in 2015, its experts took a leading role in assessing the data and defining different categories of ovarian cysts to aid diagnosis, and the standardized system was implemented throughout the region later that year.

“Specialty networks, knowledge sharing, and collaboration can catalyze new research at scale, instead of a small number of ideas moving slowly toward implementation. As we progress, we will learn from what’s worked and leverage it to speed the entire process.”

—DOUGLAS CORLEY, MD