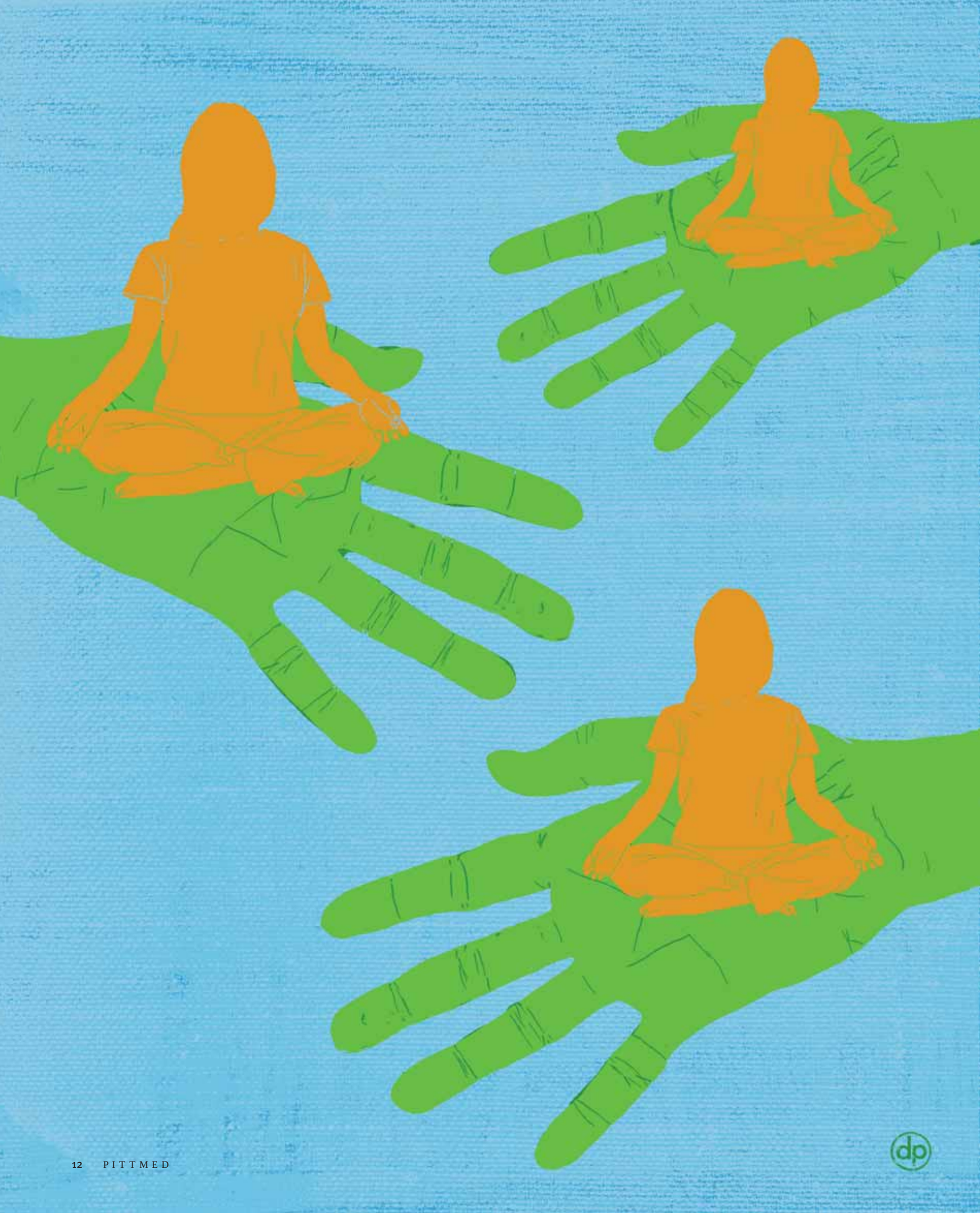


HOW TEAM MENTORING AND $4.5 MILLION A YEAR ARE CHANGING CLINICAL RESEARCH

BY JOE MIKSCH

THE BEGINNER'S MIND

Pick young doctors with great ideas, pair each with a team of dedicated mentors, and watch them soar. A program that takes this approach to grooming clinical research scholars is part of Pitt's response to what some saw as a failure among the nation's academic medical institutions to turn a sufficient number of their young researchers into established, self-sustaining members of the senior faculty who engage in clinical research.

On a winter day, Debra Weiner and Thomas Rudy stand in the UPMC Pain Medicine Program conference room, casually discussing the impact ratings of various scientific journals, which reflect how many times papers in a given journal are cited. On the whole, they conclude, the ratings have little to do with the quality of science in a particular publication.

With that decided, in comes Natalia Morone, who's experiencing a sort of pain, one familiar to those who inhabit the world of academic medicine: figuring out just what all the data she intends to publish in one of those journals mean.

A bit harried, the curly-haired and bespectacled Morone takes a seat. She, like Weiner and UPMC Pain Medicine Program research director Rudy, is interested in pain, particularly in nonpharmacologic ways in which this bane of humanity can be treated.

ILLUSTRATIONS | DAVID POHL

One tool she's studying as an analgesic is mindfulness meditation, a practice of consciously living in the moment and maintaining focus. Morone has practiced meditation since she was 19 and plans to teach the mindfulness meditation technique to older people with chronic pain as part of a study. By imparting a skill that allows adherents to focus on the here and now, Morone hopes to help study participants ameliorate their suffering. She'll then examine the effect the technique has on the severity of their suffering. Recruiting participants is still a few months off, she says.

Also in the works for Morone is a functional magnetic resonance imaging study looking into what areas of the brain respond to pain. But today's meeting is about yet another project.

Morone is an MD and assistant professor of medicine at the University of Pittsburgh. She's soliciting Weiner's and Rudy's expertise today for a study seeking answers to the question: What common characteristics bind older people who seek alternative therapies for pain?

"This is making me nervous," she says to Weiner and Rudy about preparing to publish her findings. "It shouldn't, but it is. If I seem frantic to you, it's not caffeine."

"What about that meditation you teach?" chides Rudy, whose beard and past-ear-length red hair somehow complement his ready humor.

"I'm doing something you have to be a meditator to understand," Morone replies. She explains that she can be aware of her nervousness and other physical sensations while keeping her mind calm. She sits upright and gently shakes her arms over the table in a good-natured demonstration.

Weiner and Rudy are on hand to help Morone keep her cool—as well as to help her refine her data, plan studies, apply for grants, suggest worthwhile meetings for her to attend, and generally guide this junior faculty member through the early stages of becoming an established clinical researcher. They're her mentors.

Mentorship is nothing new to academic medicine. Really, it's a component of more or less any professional career. The older, more established doctor, lawyer, or businessperson takes the fledgling under her wing.

The difference with what's on the verge of happening here in the austere UPMC Pain Medicine Program conference room is that this mentoring relationship—like nearly 30 others involving junior faculty among all the schools of the health sciences—is organized, team-based, multidisciplinary, and funded by the National Institutes of Health to the tune of $4.5 million a year over the course of five years.

Called the Clinical Research Scholars Program (those in the know pronounce the acronym *crisp*), this approach to career development is a response to what the NIH saw as a failure among academic medical institutions to turn a sufficient number of their young researchers into established, self-sustaining members of the senior faculty engaged in clinical research.

CRSP codirector Doris Rubio, a PhD associate professor of medicine, says the NIH saw that only 40 percent of those receiving its early career development grants went on to earn an R01 grant, the gold standard of funding for advanced investigators. (R01s are typically the first grants received by independent, experienced researchers.) Research careers were stalling, burning out, or simply never taking off. Money was being wasted, and opportunities to advance health care were lost.

To establish a new, more reliable path, the NIH sought help from academic medical institutions. Pitt's School of Medicine and other schools of the health sciences weren't shy about pitching ideas. The NIH liked Pitt's approach, which focused on multidisciplinary research and team mentoring and would become CRSP. Pitt's is one of 12 such programs supported by the NIH.

Wishwa Kapoor is a striking man, with his shiny pate, closely cropped gray beard, and athletic physique. He's calm and self-possessed. His research has set the standard for treatment of syncope and community-acquired pneumonia. He's also known for his work training future leaders in academic medicine, with his role in creating CRSP being the most recent contribution. (His colleagues rave about him: "A natural mentor and a very impressive person," says Rubio.) Kapoor was instrumental in designing CRSP. Today, as the program is about to enter its third year, he remains its director.

"It used to be you could sit in your lab, and you could do something by yourself," says Kapoor, an MD/MPH who, in addition to his leadership of CRSP, is chief of the Division of General Internal Medicine and the Falk Professor of Medicine. "Today, things are so complicated that you need a wider approach."

Kapoor gives the example of a researcher keen to divine genetic links to congestive heart failure. Such a study requires expertise in cardiac disease, genetics, the lab procedures necessary to analyze genes, and statistics.

"One single person doesn't have all that," Kapoor says. "That's why you need multiple people to come together."

At the UPMC Pain Medicine Center, we see Kapoor's hypothetical in practice. Morone, with seven others, is a member of Pitt's inaugural CRSP Class of 2005. Nine more scholars joined in the summer of 2006, and another class will be chosen later this year. (The CRSP staff is digging through 40 applications of about 100 pages each.)

Morone's expertise is in internal medicine and pediatrics. Before arriving at Pitt, she earned her medical degree from Michigan State University; undertook a residency in internal medicine and pediatrics in Phoenix; and practiced general medicine in rural Colorado. Along the way, she became interested in pain research and, with that in mind, earned a Master of Science in Clinical Research degree here in 2005. When the call first went out for CRSP applicants, she leapt.

Pain is multidisciplinary, she thought—with elements of anesthesiology, physical therapy, psychiatry, and samplings of other disciplines—and CRSP is multidisciplinary in nature.

"It was kind of natural for me to apply for it," she says. "I feel I was lucky to be here and receive the [CRSP] award."

CRSP scholars are required to find at least two mentors, which is the short answer to how Morone ended up consulting with Rudy and Weiner in the pain center conference room on a snowy December afternoon.

Rudy is a PhD professor of anesthesiology, psychiatry, and biostatistics and Weiner, an MD, is an associate professor of medicine, psychiatry, and anesthesiology with an interest in acupuncture. This day's mentoring session—they typically take place every two weeks—calls upon Rudy to wear his biostatistician's hat and for Weiner to call upon her knowledge of complementary and alternative medicine (CAM), earned through her experience in acupuncture.

Morone is hoping to divine the factors that make an older person suffering from knee pain more or less likely to use CAM techniques like acupuncture, homeopathy, massage therapy, aromatherapy, naturopathy, or biofeedback. Morone's tools are a questionnaire of her design and patient-related data collected by Weiner and Rudy.



At the conference table, the questions and answers start to fly.

Morone brings up issues like "Should I put the questionnaire itself in an appendix to the forthcoming paper?" (Yes, Weiner says. She and Rudy have been deluged with requests for copies of questionnaires by readers of previously published articles. Save yourself the aggravation and put it in, they tell Morone.)

Morone solicits guidance for larger issues, too, like "What makes a good questionnaire?"

"This last table I'm starting to do is getting at the idea as to what might be some of the barriers to CAM," Morone tells her mentors.

"So this is basically a yes/no question. 'Have you ever heard of this therapy?' I assumed 100 percent would have said 'yes' to acupuncture, but I didn't get that," she continues.

This sparks a conversation about the subtlety of questions and responses.

Weiner talks about the logic:

"It's parsing out the difference between 'Have you heard?' and 'Do you know?' The former implies less familiarity.

"It's the trick of language."

"That's why questionnaires are so hard," Morone says, shaking her head.

Weiner chimes in: "The immediate question after that, though, is, 'How much do you know about this treatment? A lot? Some? A little?' It would become pretty obvious if they'd just heard of it or if they have real familiarity."

"I think [the analysis] would be useful information to put into a table," Rudy says.

"OK, good. I have that [data about degree of familiarity], and I'll add it," Morone agrees.

She's still struggling with an even larger question: What does she have to say in this paper?

In addition to being asked how many types of CAM they practice, Morone's subjects were asked about their degree of spirituality and their "paternalism," or how much they rely on the word of a physician. From Rudy's workup of the data, it looks like those who use two or more types of CAM are highly spiritual (they pray rather than seek conventional medical treatments) and highly paternal. Morone didn't expect this.

"Everything in the CAM literature says a CAM person wants more control," she says. "But we're finding it's not the case."

Rudy flips through seven pages of data, looks up, and says, "The lower the score, the more they believe that way." He realized he has made a typo. "I have to change the signs. They *are* taking more control. They're disagreeing with those statements." Sometimes an act as simple as changing a minus to a plus can make all the difference.

This interpretation is in line with Morone's instinct after all—CAM users do want more control. There's a sense of relief in the room.

Weiner chuckles about the typo. "That totally changes how we interpret it," she says with a laugh.

"I might be able to actually report something in my article," Morone says happily, knowing that her thesis has been borne out.

Which is exactly what Joan Lakoski hopes will happen. After all, she says on another day, the earlier young investigators compile track records of significant publications, the earlier they can move on to assume leadership positions at the University of Pittsburgh.

"I'm convinced that every one of our scholars is on the cutting edge of [his or her] fields," she says. "I hope CRSP will help us retain our own, because these individuals are all going to be national leaders in their respective fields."

Lakoski mentions Hilary Tindle, an MD/MPH assistant professor of medicine. Tindle is in search of smoking-cessation therapies that quell mood, sleep, and cognitive disturbances often related to kicking the habit. Her mentors are experts in cardiology and psychology.

There's also Bruce Lee, an MD/MBA assistant professor of medicine, who is working with faculty in medicine, health policy and management, industrial engineering, computer science, and sociology. Lee creates computer models to better predict the spread of epidemics and optimize how we respond to them. And there are more than a dozen others whose praises Lakoski would be more than happy to sing.

If Lakoski seems passionate about CRSP, particularly the team mentoring aspect, that's because she is. Lakoski, a PhD, is Pitt's CRSP codirector in charge of mentoring. She also serves as associate vice chancellor for academic career development, health sciences; executive director of the Office of Career Development; associate dean for postdoctoral

education; and professor of pharmacology.

Lakoski is a true believer in team mentoring and CRSP. A writer visiting her Scaife Hall office left with enough material on those topics to turn his featherweight briefcase into the reporting equivalent of a bowling bag.

Explaining the rationale behind the team mentoring approach, Lakoski turns to the business world.

"[In academic medicine] the concept has emerged over the past three or four years," she says. "Some of the best approaches and information we rely on are from industry. They've long valued teamwork over autonomy."

Don't get Lakoski wrong. As a tenured professor she truly enjoys her autonomy. But she also knows that "I won't get my R01s funded unless I bring in multiple [technical] approaches. We've all been collaborating with each other for a long time, but [the idea of creating formal multidisciplinary teams] is slowly but steadily becoming the culture of biomedical research.

"You don't do it alone," Lakoski says of academic medicine. "It's a team sport."

"You don't do it alone," Lakoski says of academic medicine. "It's a team sport."

In the world of CRSP, mentors are trained (and compensated), team meetings are regular, the exchange of ideas is candid, expectations are codified in a signed contract between the mentee and her mentors, and all involved are expected to not only look at the short-term goals of a particular project, but to attend to the mentee's career in the long-term. Lakoski and her CRSP colleagues Kapoor and Rubio give formal oversight to make sure both the scholars' and mentors' expectations are met.

The Morone/Rudy/Weiner team has fostered a sense of camaraderie, even friendship. "I went to Dr. Weiner's wedding, and Dr. Rudy played the guitar," Morone says.

"They've guided me on what kind of articles I need to read, which conferences are important to attend, and they've introduced me to other people I can collaborate with," Morone says. "They've helped me with other nuts and bolts—things like reviewing grants and manuscripts." She says she wouldn't be on her way to becoming a clinical researcher without them. "I don't have any doubt about that."

Rudy and Weiner say they don't just give, they gain. "This is a great program because of the interdisciplinary nature," Rudy says. "We challenge each other to think in different ways. And a good student is always teaching you. I believe in the impact of 'the beginner's mind.'"

"The value for the mentor," Weiner adds, "is the same benefit that comes from any teaching role: It helps you solidify what you know and what you don't, what's important and what's not. And I like the nurturing aspect of it. I like seeing that I'm contributing to someone's personal growth and development."

Kapoor sees another benefit for the mentor, one that lies in benevolent self-interest. "Practically, it means that I have faculty, for example in my own division, who I'm developing who can help advance my own area of research. They write papers; I'm on their papers. They write grants; I'm on their grants," he says.

Kapoor, Lakoski, Weiner, and Rudy all recall the impact others had on their own careers. When Kapoor was a young investigator and a recent immigrant from Afghanistan, he had a great deal of support learning how to write well in English.

When Lakoski was about to take her first faculty job, she was "9.999 months pregnant." Her mentor knew she was eager to hit the ground running and also anticipated that being a new mother at a new job would be demanding. He advised her to take it slowly.

"And, you know what, he was right," Lakoski says. "I didn't just show up and, when my brain was all postnatal, send that first grant in. I [sent it] in six, seven months later and got it funded the first time."

Weiner and Rudy say they got a lot of help along the way but see how the more formal nature and multidisciplinary approach of CRSP mentoring might have propelled them further faster.

"I've had a couple of different people [as mentors]," Weiner says. "But I wish the relationships would have been more structured. I wish people would have pushed me more."

"In retrospect," Rudy adds, "in some of my early training I didn't have as much support as [Morone] is getting. I think that support is one of the great things about this."

In addition to team mentoring, scholars can count on support in the form of having NIH pay 75 percent of their salaries for up to five years; pay for tuition, books, travel, and lab expenses; and fund access to statisticians, a data management team, and a grant writer.

"It's tremendous," Rubio says. "With other [early career] grants you do get funding, but you don't really have to do anything except file an annual report. There's nobody higher up checking on you, making sure you've done things, and trying to help you remove obstacles.

"I've told the scholars, 'We'll do whatever we can to make sure you guys are successful.' If they're not successful, our program has failed, and we as an institution are only going to have the leaders we're going to need in the future if these scholars make it."

Morone, thus far, is making it, her colleagues agree. As the mentoring session ends, she, Weiner, and Rudy set up their next meeting, two weeks hence. "I've got lots to think about," Morone says. "I'm going home, and I'll have a draft for you by the end of January. We still need to decide where to publish." She also has to plan for her mindfulness meditation study, her fMRI study, her next foray into the ins and outs of CAM use, and myriad other responsibilities.

"Not only am I happy with the mentoring," says Morone later, "but the program in general. Certainly we've been given the tools to succeed. They can't give us [future] grants, but they have given us the tools."

"In the long run, [teamwork] is going to set us apart," says Lakoski, leaning forward and exuding enthusiasm. "Look at the new medical buildings. … They're all collaborative spaces. Look at the patient who needs a team to help him through a chronic illness. It's all teamwork."

Lakoski believes that Pitt's approach to mentoring and clinical research puts it on the cutting edge of academic medical institutions. "There's some literature on mentoring, but there are very few 'best practices' on team mentoring," she says.

Kapoor says it's Pitt's intention to add to that body of literature by studying the successes and failures of its mentoring programs. By collecting data on publications by CRSP scholars and the grants they earn, by surveying mentees and mentors to find out how to make the relationships pay off, Kapoor expects to "be at the forefront of the science on this."

Lakoski, Kapoor, and Rubio don't just want to contribute to the team mentoring literature, they hope to write the book. ■



GET RESULTS

FROM BENCH TO BEDSIDE, FASTER

BY MEGHAN HOLOHAN

A few years ago, Steven Reis faced a problem. He needed to find 2,000 people to participate in his clinical trial on heart disease. But how?

As associate vice chancellor for clinical research at the University of Pittsburgh, Reis sees patients only weekly, so he couldn't rely on his patient pool. He could put up flyers in the hospitals, announcing his need for participants. But then he'd have to rely on a patient's initiative to join.

Some patients fear that participating in a clinical trial will require them to take dangerous drugs or go to a lot of doctor's appointments. Some patients are unaware of the studies. And physicians who might refer patients can't be expected to remember all 5,600 studies going on at the University of Pittsburgh at any given time.

Across the country, researchers who conduct clinical research often labor to find participants. The search for volunteers can postpone clinical trials. And the longer it takes to complete a study, the longer patients wait to see solutions in the form of approved therapies.

The leadership at the National Institutes of Health noticed that clinical research sluggishly reaped benefits in the form of new treatments. Recruitment issues, like what Reis experienced, are just one barrier along the way. In its "Roadmap for Medical Research," the NIH made the issue of streamlining clinical and translational research a major priority. Last fall, it awarded 12 inaugural grants to institutions that created plans to improve the bench-to-bedside-to-community process. The University of Pittsburgh is one of the first institutions to secure a Clinical and Translational Science Award, which it will use to fund its new Clinical and Translational Science Institute (CTSI). The NIH will award Pitt $83.5 million toward the effort. Fifty-three million dollars of the total comes from existing programs, like those at the University that educate and groom doctors to do clinical research, including the Clinical Research Scholars Program featured on p. 12 of this magazine and the master's degree in clinical research discussed in the p. 18 story.

Reis, the principal investigator on the $83.5 million grant, is one of many Pitt faculty whose work may be supported by the new institute. His own study was spurred by the fact that, overall, Blacks tend to have less coronary artery calcium than Whites. "This is particularly interesting," says Reis, "because less coronary calcium is expected to confer a lower CVD [cardiovascular disease] risk. But, as a group, Blacks have a higher CVD risk than Whites."

He thought that if he could understand the relevant physiological differences, it would translate into better treatments for everyone.

So Reis didn't just want to recruit 2,000 patients, he wanted half to be African American. He approached Lee Hipps, vice president of the Urban League of Pittsburgh. When the cardiologist explained his project, Hipps agreed to help. The two figured out the best way for Reis to recruit patients and to schedule follow-up meetings with them. Reis expects his preliminary study results to come out this winter.

Like Reis, many researchers don't start out with the appropriate community ties for recruiting their participant pools. As part of the CTSI, Hipps, along with the dean of Pitt's nursing school, Jacqueline Dunbar-Jacob, will codirect a program that establishes ties between Pitt researchers and community groups. The program architects also hope that community members will approach University representatives to inform them of health issues that concern their communities.

Pitt's CTSI is putting together another solution to the recruitment problem—a patient registry. When patients are admitted to UPMC hospitals or visit UPMC doctors, they can consent to receive information regarding upcoming studies. Each quarter, Pitt will send mailings to the patients explaining the ongoing studies for which they qualify.

Reis hopes that soon no Pitt scientist will need to post flyers advertising studies. Instead, the patients will come to the researchers. ■