All the lectures have been delivered. All the small-group presentations have been given. Even the final exam has been administered. And yet nine medical students are lingering long past the conclusion of the last official meeting of their small group in a required fourth-year DMS course called Health, Society, and the Physician (HSP).

The students are hammering out yet another component of their project—but not for a grade, not to present to their classmates, not even to impress their teachers, who have already left the meeting for other appointments. The students are still hard at work because they have bought into the idea that they can—and should—help to improve patient care.

Gathered around two laptops, the students are vigorously debating the pros and cons of various changes to a poster they’re designing to raise awareness about heart failure among resident physicians.

Part of the Process

By Jennifer Durgin

Historically, medical students have been taught how to work within the constraints of the current health-care system. But for medical students at Dartmouth, learning the hows (and whys) of improving the processes of care is now part of the required curriculum.
E stablished in 1983, HSP was the first DMS course to tackle subjects such as domestic violence, HIV, managed care, and health policy. It was also the first to focus explicitly on developing good communication skills in the next generation of doctors. And it was the first to incorporate small-group learning.

The radical redesign of HSP began in 2010, after Dartmouth College President Dr. Jim Kim gave a lecture during last year’s course. Kim explained the need for a new science focused on the delivery of health care and called for Dartmouth students and faculty to lead that new field of study. At a basic level, health-care delivery science is about finding ways to improve quality in health care, while restraining or lowering costs. (For more on health-care delivery science, see the article by Dartmouth faculty members for the journal *Annals of Internal Medicine.*)

Kim “really challenged the students to think about how poorly we execute so many things in health care,” says Dr. Virginia Reed, who earned her Ph.D. in experimental psychology from Dartmouth in 1997 and has been a course director for HSP since 1999. Dr. Michael Zubkoff, chair of the Department of Community and Family Medicine, also helped direct HSP this year.

Together, Reed, Zubkoff, and Plume decided to take on Kim’s challenge and create what they believe is the first clinical clerkship in health-care delivery science. In other words, in addition to attending lectures, all of the students were assigned to a small group to work on a real-life quality-improvement initiative. The hope is that these students will graduate from DMS with a solid understanding of clinical quality improvement and ready to make changes—even if just small ones—as they enter their residencies at other institutions across the country.

“We do a very good job of preparing people like you for the practice of medicine,” Dartmouth Medical School’s dean, Dr. Wiley “Chip” Souba, told the students when he gave one of the first lectures in this year’s course. “And we do a very good job of preparing you and your colleagues for the practice of research . . . and the practice of education.” What DMS and other medical schools need to do better, he went on, is to prepare medical students for “the practice of leadership.”

He elaborated on the concept later, noting that “the changing landscape of medicine and the new demands on physicians require that we change the way we educate our medical students.” Simply teaching them how to practice medicine is not enough. Doctors must also be leaders, Souba maintains, and part of being a leader in health care means working to make its processes and systems better by contributing to quality improvement. “We are beginning the process of curricular reform at DMS,” he adds, “to create a four-year experience that prepares our students for the practice of medicine and the practice of leadership.”

U ntil this year, DMS students have gotten only a little exposure to quality improvement, health-care systems, and the health-policy research that Dartmouth has become internationally known for. The standard course content in quality improvement, health-care systems, and health-policy research adds up to about six hours of large-group lectures and discussions in Years 1 and 2, according to a recent paper by several DMS faculty members for the journal *Health Affairs.* DMS students also have an opportunity, in Year 2, to boost their knowledge in these subjects through a Health Leadership Practicum elective. First offered in 2007, this elective offers second-year students a chance to work in groups of two or three on a clinical improvement project. But so far, only a handful of students each year have taken the elective, which totals about 30 hours. Still, this modest exposure appears to be much greater than is offered at many medical schools in the country, even before this year’s changes in HSP—not to mention further curricular changes that are underway.

A study group led by Dr. Gregory Ogrinc, an associate professor at DMS and a graduate of Dartmouth’s health policy program, recently made several curriculum recommendations. The group, which included three students, suggested that Year 1 incorporate more material on the structures, processes, patterns, and people that make up health-care systems. To Year 2, the group suggested adding coursework on the “pathology” of systems—
The HSP course also incorporated many of the recommendations, even before Ogrinc and his study group were finished compiling them. Since this year's fourth-year students didn't experience the revamped orientation when they were first-years, HSP gave them their first major exposure to quality improvement and health-care systems.

It also offered many of them their first chance—and probably their last before graduation—to hear lectures from nationally prominent Dartmouth health-policy experts like Dxs. Elliot Fisher and H. Gilbert Welch, as well as other health-care thought leaders at Dartmouth. Dartmouth President Jim Kim, for example, cosponsored the international nonprofit Partners in Health and is a former director of HIV/AIDS at the World Health Organization. Dr. James Weinstein, the director of the Dartmouth Institute for Health Policy and Clinical Practice and the president of the Dartmouth-Hitchcock Clinic, is the principal investigator of the nation's largest randomized trial comparing surgical and nonsurgical treatments for back pain. And Dr. Albert Mulley, the director of the new Dartmouth Center for Health Care Delivery Science (and a 1970 graduate of Dartmouth College), was previously director of the Medical Practices Evaluation Center at Massachusetts General Hospital and a founder of the Foundation for Informed Medical Decision Making, a nonprofit dedicated to helping patients understand their health-care choices.

Having “true experts . . . talk to us about what they’re passionate about,” said fourth-year Matthew Ippolito during this year’s HSP: “it’s helping build a uniquely Dartmouth context in which to frame our continuing education. As some of us leave Dartmouth and go to other institutions, we’re going to come away with important concepts . . . that are really part of the Dartmouth culture but also, more and more, are part of the national conversation.”

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or example, the American College of Cardiology and the American Heart Association recommend that someone having a specific type of heart attack—an ST-segment-elevation myocardial infarction—should have the blocked artery cleared within 90 minutes of arriving in the emergency department. But sometimes that target is missed because of delays in administering the necessary tests or in rounding up a specialist to do the intervention, among other hurdles. Can a hospital design its processes to avoid such delays and meet the 90-minute goal 100% of the time?

That’s the sort of question that clinicians nationwide, including at Dartmouth-Hitchcock, are examining—and that Ogrinc and others at DMS want even students to wrestle with.

Many of the recommendations put forth by Ogrinc’s group will be introduced immediately, as of August 2011, says Dr. David Nierenberg, senior associate dean for medical education. “In fact,” explains Nierenberg, “some of those recommended changes have already been anticipated and put in place in the new [Year 1] orientation . . . introduced last August.” (For more on the overhaul of the first-year orientation, see dartmed.dartmouth.edu/w10/f03.)

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The course also offered “a great opportunity” to hear President Kim speak, Ippolito added. Indeed, Kim’s lecture near the end of HSP came in for overwhelming praise in a Dartmouth Medicine anonymous survey to which 28 of the 68 students in the course responded.

The anonymous survey also showed that HSP helped students greatly improve their understanding of key health-policy terms. For example, 17 of the 28 students reported that before the course, they understood only “a little” or “somewhat” the term “practice variation”—that is, the existence of dramatic geographic differences, not explained by illness severity or other patient characteristics, in the amount and cost of the health care that patients receive—but that after the course they understood the concept “modestly” or “completely.” Many other students reported an improvement in their understanding of that concept to a somewhat less dramatic degree, or an understanding that began and stayed at a moderate to high level.

The survey respondents also reported almost unanimously that HSP had improved their knowledge and understanding of how the U.S. health-care system functions.

The finding from the survey that may be most encouraging to the course directors is that 23 of the 28 respondents agreed that by the end of the course, they felt “well prepared to contribute to clinical-quality-improvement initiatives in the future.”

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hen “thinking about health policy in the past few years,” says fourth-year Richard Cheng, “it was easy to sit on the sidelines and say, ‘This problem is huge. Somebody has to do something about it. I don’t know what to do about it. It’s too ambitious.’ You kind of give yourself an excuse to sit on the sidelines because you don’t feel like there is a role for you.”

Now, Cheng says, he sees that he can play a role in improving health care, even as a student and, soon, as a resident.

Fourth-year Hsuan “Katie” Dong, who was also in the heart-failure group, echoed that sentiment. “You realize that after you graduate, your role [as a resident] can impact health-care delivery [and] health-care costs,” says Dong, because residents are often the ones in a hospital writing orders.

The small-group projects in particular gave “a viewpoint into what we can do in the future,” says another fourth-year, Nicholas Tangchaisavang, “to impact . . . whatever system we end up in.”

This sort of feedback is “heartening and humbling,” says Reed, who put more time and effort into redesigning the course than anyone else. The new version of HSP is not intended to be a quality-improvement offering per se, or “TDI-lite,” she explains, referring to the Dartmouth Institute for Health Policy and Clinical Practice. The goal was to give DMS graduates a sense of what health-care delivery science is and why it’s important, as well as
When a patient with heart failure shows up at the hospital with a preventable complication just days after a previous hospitalization, that’s bad for everyone.

At Dartmouth, 12% of heart-failure patients are readmitted within 30 days. That’s a lot better than the national average of 23%, but Kono would like to get DHMC’s rate below 10%.

Each of the eight small groups was led by two facilitators and one clinical liaison—a doctor or nurse who was intimately involved with the initiative that the students were supposed to work on. The students were charged with studying the project and creating some sort of “deliverable”—a report or product—by the end of the month-long course. That was a tall order and, in the beginning, many students felt frustrated about charges that at times they felt were too vague.

“We were flailing around,” recalled one student. “We didn’t have access to all the information that we knew was out there, and we felt like we were being thrown into projects that we knew already understand and have been exposed to it. But reaching that level of engagement involved a lot of discomfort and distress, most of which occurred within the small-group projects.

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Much to the researchers’ surprise, “many of the critically reviewed evidence-based practices we had gleaned from the literature were not being followed.”

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Following faculty leaders: A guide to health-care improvement

A new book that is part philosophical treatise and part how-to manual offers up the experiences of 14 physicians who have been leaders in changing the health-care systems in which they work. Like its title, Lessons Learned in Changing Healthcare . . . And How We Learned Them (Longwood Publishing, 2010), the book strikes a conversational and straightforward tone. That’s because each chapter is based on a talk by a different physician-leader.

Two of the contributors, as well as the book’s editor, are members of the Dartmouth faculty. In fact, Dartmouth has become such a nexus of clinical quality improvement that—as described in the adjacent feature—even medical students are now involved in the effort.

“A leader’s actual work offers an opportunity for learning and, if desirable, reflection,” writes Dr. Paul Batalden in the introduction to Lessons Learned. Batalden, the book’s editor, selected the 14 physician-leaders for a lecture series at DHMC in 2008 and 2009. “We invited some who saw themselves as educators, some who thought of themselves as researchers, and some who saw their work in the ‘operations’ of healthcare,” Batalden explains. Later, the lectures were reworked into book form.

Batalden is himself a national leader in health-care improvement practice and theory (for more about him, see dartmed.dartmouth.edu/su06/). He pioneered the clinical microsystem approach to health-care improvement. A clinical microsystem is a front-line unit, a place where patients and care teams meet—such as an outpatient clinic or an operating room. And that’s the level at which much of the improvement described in Lessons Learned takes place.

Dr. William Edwards, chief of neonatology at DHMC, shares several stories in the book about how direct observation can reveal best practices that sometimes run counter to standard thinking. In the early 2000s, for example, Edwards and colleagues from other hospitals visited the neonatal intensive care units (NICUs) that had the lowest infection rates in the country. Much to their surprise, “many of the critically reviewed evidence-based practices we had gleaned from the literature were not being followed,” he writes. By carefully examining the practices in those units, Edwards and his colleagues were able to come up with new ideas for lowering infection rates in their own NICUs.

They then tested those ideas in a randomized controlled trial of over 1,200 extremely tiny babies at 53 participating centers. One finding was that, counter to conventional thinking at the time, topical skin treatments increased rather than decreased the risk of infection.

“But change does not always equal improvement,” Edwards cautions. “I’ve spent a good deal of time trying to figure out which change is improvement and which isn’t.”

More sage advice is doled out by Dr. Carolyn Kerrigan, chief of plastic surgery at DHMC. In her chapter, Kerrigan offers concrete examples from her own improvement work. For instance, she describes how her section improved the availability of appointments by lengthening the time between postoperative follow-up visits. “A typical outpatient postoperative follow-up schedule,” explains Kerrigan, “looks something like this: two days, 10 days, three weeks, six weeks, three months, six months and one year.” But that is “likely much more frequent” than necessary, she says. So she decided to change that pattern.

Now, she talks to her patients by phone the evening of the surgery, sees them in person 10 days later, and then not again until six months later, unless they have concerns. With this pattern, patients don’t have to take time for unnecessary visits and Kerrigan has more openings so when patients do want an appointment, they can get one quickly. “Surprise, surprise,” he writes. By carefully examining the critically reviewed evidence-based practices in their own NICUs, they then tested those ideas in a randomized controlled trial of over 1,200 extremely tiny babies at 53 participating centers. One finding was that, counter to conventional thinking at the time, topical skin treatments increased rather than decreased the risk of infection.

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By the end of the month, the heart-failure group included both students and residents. “Hearing different ideas and having the ability to entertain concepts that you don’t necessarily mean that your group still cannot produce meaningful work.”

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Jennifer Durgin
initially agree with,” wrote another student, “are crucial to effective reform. . . . I learned a lot of patience in the group and ultimately am extremely impressed by what my fellow group members came up with . . . even when initially some of their ideas seemed misguided to me.”

Yet another student came away with this insight: “As much as I had appreciated the importance of nurses and other health-care providers prior to the project, I had never realized or appreciated their impact on improving and changing the system.”

HSP planning committee member Steve Plume was pleased to see that the students gained a sense of the “real issues people face trying to work together across different experiences, attitudes, and perspectives.” Learning how to work well in a group, even a difficult group, is an important skill for today’s doctors because health care is now widely considered to be a team effort.

HSP clearly changed the way this year’s DMS graduates will view their role as physicians. Only one student of the 28 who responded to the Dartmouth Medicine survey disagreed with the statement that HSP had “changed how I view the role of physicians within the health-care system.” In fact, 13 said they “strongly agree” with that point.

“The thing that the course left me with, which I wasn’t expecting,” says Chetan Huded, “was that you can’t sit on the sidelines of this. You’re either actively part of the solution or you’re actively part of the problem. So you have to pick where you are going to fall. There is no opting out and saying someone else will fix it.”

That’s just the kind of ownership the HSP course directors, the dean of the medical school, and the president of Dartmouth College were hoping for.

As another student put it: “Health-care reform is my problem.” That sense of responsibility and leadership might inspire these soon-to-be doctors to put in the extra time and effort to make improvements in the systems they find themselves within, even during residency.

Just as it drove the students in the heart-failure group to keep chugging away at their project, even after nobody was looking.