

CHILL-TIME: DMS students do get an occasional break, including in a long-running ice hockey face-off against University of Vermont med students. This year, DMS took the prize—irreverently called the Specimen Cup—for the third year in a row, in a thrilling shootout.



**We do not have permission to include in our online edition
the text that was in this box in our print edition.**



ROCKET SCIENCE: Since 1973, 23 physicians have flown in space for the U.S. One of them was Dr. Jay Buckley, a longtime member of the Dartmouth Medical School faculty. He oversaw neuroscience experiments on a 1998 mission on the space shuttle *Columbia*.

THEN & NOW

A reminder of the pace of change, and of timeless truths, from a 1961 publication titled *Medical Education and Dartmouth*:

“Unfortunately the good health Americans have come to take for granted is threatened by an imminent critical shortage of doctors. This alarming conclusion was reached in November 1959 by a special Consultant Group appointed by the U.S. Surgeon General.”



141

Ratio of doctors per 100,000 people in 1961

228

Ratio of doctors per 100,000 people in 2000

30%

Increase over 2002 medical school enrollments now called for by some experts, who fear a shortfall of physicians by 2025

Crohn’s tool is a “home-made” solution

Fortunately for people with Crohn’s disease, Dr. Corey Siegel and his wife, Lori, like to bring their work home. Corey Siegel is a Dartmouth gastroenterologist, and Lori Siegel is an environmental engineer. Together, they developed a tool to help Crohn’s patients make difficult treatment decisions.

There is no cure for Crohn’s disease—an inflammatory bowel disease that can cause pain, ulcers, and other complications that sometimes require surgery.

But medication can also be effective. The problem is figuring out which patients will benefit from which drugs.

Drugs: Traditionally, doctors started patients on mild drugs like antibiotics and switched them to stronger ones only if the weaker drugs failed. But, Corey Siegel says, “we’ve realized that if we . . . use our strongest medications sooner, we do much better. We can prevent complications. We can prevent surgeries.”

But the stronger drugs have more serious side effects. Immunomodulators, which suppress the immune system, can be very effective but can also lead to infections, and even death in 15 of every 10,000 patients. Drugs called biologics also carry risks, albeit minuscule, of life-threatening complications such as lymphoma. “We don’t want to expose anybody to possible side effects who doesn’t need those medications,” Siegel says.

That’s where Lori Siegel, and

her Ph.D. in environmental engineering, came in handy. She uses computers to model complex natural systems, such as weather. “The climate is about as complex as you can get—like the human body,” she says.

As the Siegels talked to each other about their work, they realized that it might be possible to use a computer model to predict a patient’s risk of complications and likelihood of benefiting from

Lori Siegel notes that patients don’t want to hear statistical jargon.

different treatments. So they created a program that takes a patient’s age, gender, location of the inflammation, and blood test results—and predicts the risk of a serious flare-up in the next three years. A physician can then enter different treatments into the program and see the risks and benefits of each option. The results appear as two lines on a graph, baseline risk in blue

and risk with treatment in red.

“This model isn’t to convince people to go on medications, it’s to try to find the right people who need those medications,” Corey Siegel says.

Lori Siegel notes that when patients are considering treatment options, they don’t want to hear statistical jargon. “They want to see what their personal risk is and how to make sense of that,” she says.

Data: The Siegels used data from about 800 children with Crohn’s disease to create the program. They plan to validate it by testing its predictions against a second set of patients. If the predictions line up with what that dataset shows, the tool could then be rolled out for use with patients. For now, it will be limited to use in children, but the Siegels hope soon to start collecting the data they’ll need to create a similar tool for adults with Crohn’s disease.

AMOS ESTY

JOHN HESSON



The Siegels show off a screen shot of one of the graphs that their tool produces.

REALLY BIG GREEN: Dartmouth-Hitchcock was admitted to the Environmental Leadership Circle, the highest recognition awarded by Practice Greenhealth, a national organization of health-care facilities committed to environmentally responsible operations.



Elective is valuable, beyond a shadow of a doubt

Starting when they meet their first patient at a doctor's side, medical students see physicians as their teachers. Typically, they don't see nurses in that role. But times are changing. In 2004, DMS first- and second-year students responded in impressive numbers to a new elective—one that offered them a chance to learn from nurses about their role in health care. Other schools are now inquiring about the popular Shadowing a Nurse course.

Dynamic: Before she took the course, "my thoughts of the nursing profession were incredibly naive," says Erica Holland, DMS '13. "I had never really talked with a nurse or taken the time to notice them in the hospital." She learned that a physician's attitude toward nurses makes all the difference in their working dynamic.

That's the kind of lesson that Dr. Joseph O'Donnell, senior advising dean, and Ellen Ceppetelli, director of nursing education, had in mind seven years ago. At the time, both were teaching in a fourth-year case-based course and found that students couldn't solve a problem for which the best solution was to seek information from a nurse.

This concerned Ceppetelli, as well as O'Donnell, whose daughter, Jenny, was a nursing student in Pennsylvania at the time. She had gone on rounds with medical and pharmacy students and suggested to her dad that DMS offer an elective with nurses in a teaching role and give students a chance to talk with each other

afterward about their experience.

So O'Donnell and Ceppetelli set up Shadowing a Nurse. Wanda Handel, a nurse in the neuroscience special care unit, has participated in the elective for several years. "My goals are for the students to observe collaborative communication between nurses and physicians and to learn to see the patient through a nurse's holistic view," she says. "I also want them to see just how smart nurses are."

Holland was indeed surprised by how much nurses know and by the amount of record-keeping they oversee. "I was absolutely amazed by how many different tasks the nurses could juggle and still have a smile on their face," she says.

Clinton Orloski, DMS '13, who took the elective to better understand how a medical team functions, was impressed that Pe-



Jessica Ash, left, is one of the nurses who's taught in the shadowing elective.

PHOTO: COURTESY OF DARTMOUTH COLLEGE

ter Nolette, a specialist in wound care, was able to ease a patient's anxiety by explaining and applying a different bandage.

Reflection: After two shadowing stints, students in the elective meet in three 90-minute classes to share their experiences and lessons learned. A reflection paper is also a requirement of the elective. In a 2009 article that Ceppetelli and O'Donnell wrote for *Academic Physician and Scientist*, they identified two themes that emerged from these papers:

nurses' intimate knowledge of patients and their

families and how they cultivate those relationships, and nurses' oral and written communication to maintain quality and safety for patients.

O'Donnell calls the elective "very successful" in preparing students to work in an interdisciplinary way with nurses. He'd like to see the subject brought into the mainstream for all medical students.

Profession: Handel says teaching the elective made her "very proud," as she saw students walk away with a better understanding of nursing as a profession.

From the student perspective, Holland says she'll "definitely remember" her shadowing experience. "I now understand how much of a resource the nurses can be," she says, "and, if you treat them with the respect they deserve, how productive and effective a healthy relationship [can] be for the nurse, the doctor, and especially the patient."

ROSEMARY LUNARDINI

THEN & NOW

A reminder of the pace of change, and of timeless truths, from the Spring 1984 issue of this magazine:

"In an effort to broaden its range of services and strengthen the clinical faculty in maternal and child health, [DHMC] has instituted a program of certified nurse midwifery. . . . A team of four midwives . . . [is] offering a wide range of services to interested individuals and families."



1931

Year the first U.S. school for nurse midwives was established

1983

Year the nurse midwifery service opened at DHMC

9

Number of certified nurse midwives now practicing at DHMC



WORK SHOULDN'T HURT: The Dartmouth-Hitchcock employee injury rate is well below the national average. Last year, it was 4.5 per 100 employees, and this year it's 5.7; the U.S. average is 7.8. And DH's injury severity is one-third the national rate.

CULTIVATING BABIES' BREATH

Every year, millions of laboring women around the world anxiously await the sound of their baby's first cry. For many, that sound never comes. The World Health Organization (WHO) estimates that a million babies die each year because of an inability to breathe immediately after delivery, and a million more suffer lifelong disabilities due to compromised breathing at birth. In hopes of changing those statistics, WHO, the American Academy of Pediatrics (AAP), and other organizations are backing the Helping Babies Breathe initiative—one of whose leaders is Dr. George Little, a Dartmouth neonatologist.



In the U.S., when a newborn needs help breathing, birth attendants follow a clear-cut procedure. But it's "too resource-dependent and complicated" for the developing world, says Little. So Helping Babies Breathe created a procedure that can be used anywhere.

It has been tested in Kenya, India, Pakistan, Bangladesh, and Tanzania and is about to be deployed in 63 countries with infant mortality rates the United Nations deems high. At an unveiling in early June in Washington, D.C., Little and colleagues testified before Congress and trained several hundred people, who will train others. In time, there should be more tears of joy and fewer cries for help from mothers worldwide. J.D.

A CLOSE LOOK AT ENDOSCOPY

Last November, about a dozen regional physicians gathered in a conference room at DHMC to learn about some of the latest endoscopic procedures. But instead of listening to speakers read bullet-points from slides, they watched live as DMS faculty perform several procedures. In one case, physicians used radiofrequency ablation to destroy precancerous cells in a patient's esophagus. In another, they used endoscopic ultrasound to diagnose chronic pancreatitis.



The live format allowed attendees to ask questions during the procedures. "It is a way to educate our referring physicians," says Dr. Stuart Gordon, one of the event's organizers. "I think many prefer it to the typical didactic lecture format." Dr. Timothy Gardner, another organizer, says attendees "have been impressed. We felt that this would provide a wonderful opportunity for our local referring providers to see what happens to their patients when they are referred to DHMC for advanced and routine endoscopic care." The next "EndoLive" symposium is scheduled for the fall. A.E.

Program puts back problems on the front burner

As many as 50 million Americans suffer from chronic back pain, and only a small percentage of them can benefit from surgery. For the rest, the options for relief may be limited to standard physical therapy, painkillers, avoiding activities that aggravate their pain, or even changing jobs.

Specialized: But since 2003, Dr. Rowland Hazard and his colleagues at DHMC's Spine Center have been taking a different approach to back pain with the Functional Restoration Program (FRP). The 14-day program helps patients recover mobility, flexibility, strength, and endurance—despite their pain—with specialized physical training and education.

Rather than focusing just on pain relief, the FRP starts with understanding each patient's individual goals—such as returning to work, resuming a hobby, or simply doing household chores. The program includes dynamic workout sessions, as well as training in how to isolate and exercise key muscles whose function is essential for patients to meet their goals. There are also relaxation sessions to complement the physical activity. In addition, physicians teach patients pain-management strategies to help them maintain their newfound functionality.

Model: Patients in the FRP learn "what they can and can't do and what works for them, which is quite different from a

top-down, authoritative model," explains Hazard. "Within that model of learning . . . people learn to trust themselves, and that's really a key to getting better. [Patients] leave here with a regimen . . . that they then continue on their own."

After completing the program, patients come back to the Spine Center one month and three months later for a follow-up assessment of their strength, flexibility, and endurance and of their pain, goals, and overall mood. Based on results from 300 recent graduates, the FRP works well; pain and depression scores go down and flexibility and strength scores go up. The program bases success on participants' satisfaction with their progress, rather than on a pathology-focused model based on meeting broad norms.

Idea: "It's very exciting," says Hazard, "to see people getting better with an approach that is not made up of pills and shots and surgeries." Hazard, who helped create the FRP, was inspired by a similar program at the University of Texas, where he did a fellowship in orthopaedics. He brought the concept to the Spine Center seven years ago and has been refining it ever since.

About 80 people participate in the FRP each year, coming from all over, primarily New England and New York State. They range from a soldier injured in Iraq to a teenager with inex-

It's "exciting to see people getting better [without] pills and shots."



WHAT A RELIEF: Dartmouth's commitment to the relief effort in Haiti continues apace. In May, a 14-member team spent two weeks at a hospital in Port-au-Prince. So far, 39 people and 25 tons of medical supplies have been sent by the Dartmouth Haiti Response.

FACTS & FIGURES

Blood counts

60%

Percentage of the population eligible to donate blood

5%

Percentage of those eligible who do donate blood

95%

Percentage of people who will need a blood product sometime during their lives



35

Units of whole blood that must be collected every day to meet the needs of DHMC patients (a unit is about a pint)

10 to 12

Units of blood in the average adult's body

3.4

Units of blood in the average transfusion

384

Units of blood that would be donated by someone who gives blood every 56 days, from age 17 to age 76

10

Number of minutes the average whole blood donation takes

866-40-DONOR

Phone number for the Dartmouth-Hitchcock Medical Center Blood Donor Program

SOURCE: DARTMOUTH-HITCROCK MEDICAL CENTER BLOOD DONOR PROGRAM

VA mental-health portal is first of its kind

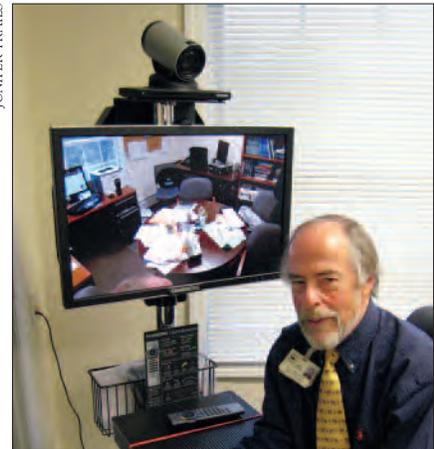
Veterans in rural areas who need mental-health care often must drive several hours to the closest Veterans Affairs medical center. But now, thanks to a first-of-its-kind telemedicine service, veterans throughout Vermont and New Hampshire can talk with a VA psychiatrist from a local doctor's office.

Rural: "This is something I've been trying to do for a decade," says Dr. Andrew Pomerantz, a psychiatrist at the VA in White River Junction, Vt., and the leader of the project. "Year after year I would put in proposals to build VA mental-health care into existing community care—non-VA care—and the answer was always 'no.'" Finally, in 2009, his proposal was funded with an \$842,000 grant from the VA Office of Rural Health, thanks in part to support from Senator Bernie Sanders.

"If you live in a rural area, it is often extremely difficult to access the kind of quality psychiatric or psychological services that we want vets to have," Sanders told the Associated Press in January.

But lately, says Pomerantz, "there's more willingness on the part of the VA, nationally, to partner with community agencies." VA services are typically not integrated into private primary-care practices, where a lot of veterans get their care. The main reasons are security and cost. Setting up the initial seven practices required installing a T1

JUNIPER TRAILS



Pomerantz, with one of the portals.

fiber-optic line to each location, so data can be transmitted securely, as well as purchasing a web camera and monitor for each office. As the first VA to try such a project, "we're having to solve all of the problems of contracting, privacy, security . . . all that," says Pomerantz.

So far, only a handful of veterans have made use of the service, but Pomerantz says that is because it's so new and hasn't been widely marketed yet.

Thousands of veterans could potentially use it. About 20% of vets seek mental-health care, says Pomerantz. In Richford, Vt., for example, the first site to open, 300 to 400 veterans a year will likely use the service.

Drive: Once all seven locations are up and running, any veteran in Vermont or New Hampshire should be within "a reasonable drive" of VA mental-health care, says Pomerantz.

JENNIFER DURGIN