



CAPITOL ONE: In March, DMS's David Goodman, an expert on the physician supply, was invited to testify about health-care workforce issues before the U.S. Senate Finance Committee. For more about Goodman's work, see dartmed.dartmouth.edu/sp09/i03.

For a **WEB EXTRA** about undergraduate Laura Hester's study of opioid deaths, see dartmed.dartmouth.edu/su09/we05.

ical Association (AMA). Clinicians define chronic pain as pain that lasts beyond the usual course of natural healing—from surgery or injury, for example—and that is not associated with a terminal illness. Before the 1990s, opioids were rarely prescribed, even to terminal cancer patients, because of the fear of addiction.

Chronic: Since then, doctors have become more comfortable prescribing opioids for terminal patients, as well as for those with chronic pain, realizing that many patients can benefit from the drugs without becoming addicted.

"But misuse and related ill effects [have increased] as well," the AMA noted in a recent article. "The number of accidental overdose deaths from narcotics or hallucinogens among those 15-64 years old . . . increased 83%, from 5,921 in 1999 to

10,829 in 2005." (For insight into opioid-related deaths in New Hampshire, see "A painful conclusion" on page 10 and the web-extra in the box above.)

Estimates of the total number of Americans using opioids for chronic pain are not readily available. However, the FDA recently reported that in 2007, 21 million prescriptions for long-acting opioids were dispensed to about 3.7 million unique patients. Perhaps of more concern is the fact that 5.2 million people age 12 and older reported using prescription pain relievers for a nonmedical purpose in the past month, in a 2007 survey conducted by the Substance Abuse and Mental Health Services Administration.

Such national trends seem to be showing up locally, says Fanciullo. Many primary-care practices in New Hampshire and Vermont have stopped prescrib-

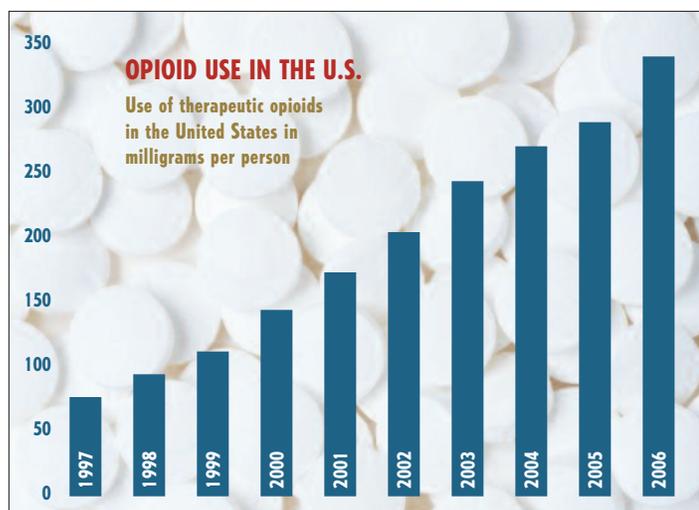
ing opioids entirely, he says. This likely means that more patients are seeking opioids from DHMC—either to treat pain or because they are addicted, or both.

The Pain Management Center is not the only service experiencing this trend. Obstetrics and gynecology has seen an increase in the number of pregnant women on opioids, and the number of opioid-dependent newborns is increasing. Between October 2007 and October 2008, 67 babies admitted to or born at DHMC were diagnosed as being substance-exposed—about 10 more than in the previous 12 months. And Dr. Bonny Whalen, medical director of DHMC's newborn nursery, expects that number to increase to almost 100 this year.

Policy: For providers who treat adults, the national and DHMC guidelines offer advice on how to prevent the abuse and diversion of opioids. DHMC's guidelines include some policy changes, too. Patients prescribed opioids by a Dartmouth provider must now sign a form that outlines the risks and responsibilities associated with taking such drugs and signifies that they agree to undergo periodic urine drug screens in order to confirm that they are taking their medication as directed. The form also tells patients that there are other ways to effectively treat pain, such as physical therapy, psychotherapy, injections, operations, and non-opioid medications.

"Opioids are the final option," says Fanciullo. Or at least they should be.

JENNIFER DURGIN



The use of therapeutic opioids—natural opiates and synthetic versions—increased 347% between 1997 and 2006, according to this U.S. Drug Enforcement data.

THEN & NOW

A reminder of the pace of change, and of timeless truths, from the 1957-58 edition of the *Dartmouth Medical School Bulletin*:

"The medical library occupies the mezzanine floor of the Baker Library, where over 30,000 volumes have been segregated from the stacks. The current numbers as well as the bound volumes of over 300 periodicals devoted to the medical sciences are to be found in the journal room on this floor."



2

Number of biomedical libraries now (one in Hanover, one in Lebanon)

302,000

Volumes in the collection

>3,800

Number of electronic journal subscriptions

3 million

Hits on the biomedical libraries' website in FY08

NO BOOB: When the *Today Show* tackled “the issue of too much cancer screening,” health-care blogger Gary Schwitzer said, “thank goodness they had one of the best evidence-based minds on the set . . . Dartmouth’s Dr. Gil Welch.”



THEN & NOW

A reminder of the pace of change, and of timeless truths, from this magazine’s Summer 1989 issue:

Dr. Robert Markison, DMS ’74-5, wrote about the use of multimedia computing in medical education: “The creation of multimedia teaching materials involves the assembly of text, data, animation, and sound. . . . Multimedia computing is still a brand-new medium, just as ‘talkies’ were still new to the motion picture industry through the late 1920s.”



2006

Year this magazine launched multimedia “web-extras” in its online edition

>1,500

Average monthly visits to the most popular web-extra

2008

Year that DM’s web-extras won a national award

Physicians sink their teeth into dental care

Dr. Melanie Lawrence, a family physician in Bradford, Vt., is tired of seeing toddlers with teeth so decayed they need to be pulled. A few states over, in Maine, Dr. William Alto is “increasingly frustrated” that his patients often lack dental care because they can’t afford it or can’t get a dentist to see them.

Scope: Both Lawrence, an adjunct assistant professor at DMS, and Alto, a professor in the Maine-Dartmouth Family Medicine Residency, have taken action. The initiatives they’re helping to spearhead are not related. In fact, until recently, they were unaware of each other’s efforts. But both are aiming to improve the dental health of their patients, many of whom depend on Medicare or Medicaid or lack health insurance entirely. It’s a new wrinkle for physicians, who used to consider patients’ teeth to be beyond their scope.

Lawrence and her colleagues at Little Rivers Health Care are attacking the issue three ways:

- They revamped their well-child checkups to include a basic dental screening, thanks in part to the work of second-year DMS student Thomas Hoke.
- They’re working with three other health centers in northern Vermont and Ronald McDonald House Charities to staff a mobile dental unit that will travel around the region and serve children and young adults up to age 21. The van is scheduled to go into service this fall.
- They’re going to conduct an unusual pilot study in three ele-

mentary schools, where fourth-graders coach kindergartners in oral health. It’s funded by the Dartmouth Center for Clinical and Translational Science.

In the study, four fourth-grade classes will learn how to take care of their teeth by avoiding sugary foods and brushing and flossing correctly. Then two of the classes will prepare and give a presentation to kindergartners. (The other two classes will be controls, to test the effect of having the older kids work with younger ones.) They’ll use fake teeth to teach the kindergartners how to floss and brush and show a PowerPoint presentation about oral health.

Mouths: In addition, the older kids will help the kindergartners measure the plaque in their mouths by using disclosure tablets, chewable tablets that temporarily dye plaque red. And perhaps the best part for the fourth-graders will be dressing up in gloves and surgical masks.

“Any time you dress kids up in health-care paraphernalia, they get all excited and they think about what they are going to be when they grow up,” says Lawrence, a former day-care director. “We’re trying to hit a lot of things . . . role modeling a career [in health care] . . . a sense of social responsibility and teaching between students . . . and helping kids learn to take better care of their mouth.” Lawrence and her colleagues will also be training the elementary schools’



Under the watchful eye of Melanie Lawrence, center, fifth-grader Meghan Boardman, dressed up in doctor gear, checks out a kindergartener’s teeth.

nurses, teaching them how to screen for dental problems.

While Lawrence is tackling dental health by teaching youngsters, Alto and his colleagues in the Maine-Dartmouth Residency program are targeting doctors-in-training. The program, which is based in Fairfield and Augusta, Maine, may be the only one in the country that teaches physicians how to extract teeth and perform basic dental procedures, such as fluoride varnishes.

Maine-Dartmouth residents can also get an additional month of dental training at the Togus VA Medical Center in Augusta. That’s thanks in part to a collaboration with dentist James Schmidt, now the president of

SIM CITY: Dartmouth's 8,000-square-foot simulation center is the third-largest such center in the nation. Health-care providers can practice procedures there on lifelike manikins programmed to bleed, cry, drool, and sweat.



THEN & NOW

A reminder of the pace of change, and of timeless truths, from a 1943 book titled *Fifty Years of Service: A History of the Mary Hitchcock Memorial Hospital*:

"As early as 1776, mention is made of [a hospital] 'located in the Lebanon woods.' . . . During the next year, the college mill on Mink Brook, just below the bridge on the Lebanon road, was converted temporarily into a hospital. These, however, were isolation centers rather than hospitals in the true sense. . . . As a result of . . . the fear that these hospitals might serve as centers of contagion . . . neither served its purpose for very long."



1893

Year Mary Hitchcock Memorial Hospital opened

225

Acreage of the wooded site in Lebanon where the Hospital is now housed

DHMC develops a "green" yardstick for hospitals

It sounds like it must be a very good, "green" thing for a hospital to calculate its ecological footprint, but what exactly does that mean? It's a process DHMC recently went through, so John Leigh, manager of waste and recycling, is very familiar with the concept. He explains that an ecological footprint is "a measure of natural resources consumed as compared with the Earth's ability to regenerate those resources." To achieve sustainability, a population shouldn't consume more than its proportional share of those resources.

The Earth contains 28 billion productive acres, such as forests and croplands (which excludes deserts, polar areas, and some ocean areas). Dividing that acreage by the Earth's population, 6.8 billion, gives 4.1 acres for each person (which doesn't even factor in the 25 million other species on the planet).

Rise: "We now know that humans are exceeding the biocapacity of the Earth by about 24 percent," says Leigh. "We began to overshoot it in the mid-1980s, and we can reliably predict that the overshoot rate will continue to rise because the population is growing, the per-capita consumption rate is growing, and technology continues to drive our consumption ability."

The calculation of an ecological footprint is a complicated process. Leigh led the development of the spreadsheet-based tool that allowed DHMC to calculate its footprint, thanks to a grant from the Maverick Lloyd

Foundation. He broke the institution's environmental impact into seven categories: products, energy, food, waste, transportation, water, and built land.

Gas: Some measurements are firmer than others. For example, experts agree on the greenhouse gas emissions associated with consuming electricity and fuel oil, and DHMC engineers have tracked energy consumption for years. It was much harder to

get a handle on the impact associated with the wide variety of products that a major medical center uses—from disposable rubber gloves to massive imaging machines.

When all the best measurement models and conversion factors were settled on and applied to DHMC's calculation, the result was 13.8 acres per full-time-equivalent employee—of which there are 5,700 on the Lebanon, N.H., campus. And that doesn't even factor in the resources that all those employees consume at home.

So how does that figure compare to other hospitals? That's a good question, but it's one for which there is, as yet, no answer. DHMC

is so far ahead of the curve that no other U.S. hospital has calculated its footprint. Leigh is offering the tool he developed to other hospitals, but no one has completed the process yet.

Meanwhile, Leigh has already begun to apply the results of the calculation. For example, one startling finding was that 32% of the overall impact came from transportation. That includes by patients, visitors, and staff, with staff transportation to and from work the biggest factor.

The average one-way commute to work for DHMC employees is nearly 42 miles.

The Medical Center already helps underwrite the local bus system, Advance Transit; has supported the construction of nearby affordable housing; and has taken other steps to minimize commuting. But Leigh would like to see more done in this area. As the Medical Center considers its options, he can now plug data associated with differ-

The calculation of an ecological footprint is a complicated process.



John Leigh is the manager of waste and recycling at DHMC.

BODY OF KNOWLEDGE: Over the past 12 years, more than 15,000 New Hampshire fourth-graders have learned about their bodies and how to care for them, thanks to a program supported by the Dartmouth-Hitchcock Clinic called Granite State Fit Kids.



Finding “grace and guts” at the bedside

It would have been understandable if Ellen Stern had decided she’d spent enough time at sickbeds. But the day she saw a newspaper ad saying that DHMC was establishing a volunteer palliative-care program, she was determined to apply.

Stern’s mother had just died, and many years earlier she’d supported a cousin who was dying of pancreatic cancer. “He died really hard,” she says. “But he wanted me a part of his process. . . . I was holding his hand when he crossed over. . . . He was at peace and not hurting any more.”

The two experiences taught Stern that “if a patient is diagnosed with a terrible illness, it isn’t bang, the end. . . . If you’re lucky, you have some time . . . to get your priorities in order.”

Help: It was to help people like her mother and cousin that she enrolled in DHMC’s No One Alone program back in 2006. Volunteers like Stern—there are now 27—support the work of

DHMC’s Palliative Care Program, which focuses on improving the quality of life for patients with a serious illness or injury. The volunteers spend time with patients during long hospital stays, when people often feel lonely, bored, or isolated; they sometimes interact with patients’ family members as well. Dr. Ira Byock, DHMC’s director of palliative care, says the people chosen as volunteers “have to have a degree of emotional maturity and sensitivity to make use of the privilege of being at the bedside.”

Few: The U.S. has about 1,300 hospital-based palliative care programs; DHMC’s is one of only a few that uses volunteers. Wendy Sichel, the director of No One Alone, screens applicants carefully, assessing their “motivation, emotional maturity, tolerance, warmth, and empathy,” she explains. Not every

Volunteers “have to have a degree of emotional maturity,” says Byock.

volunteer has all those qualities in equal measure, but “I do want to see that they have empathy,” Sichel says. “I try to sense that they’re people-people.” Applicants are also asked to write an essay about losses in their life.

Those who are selected as volunteers undergo 20 hours of training from the palliative care team—doctors, nurses, a social worker, a chaplain, and Sichel and Byock. They learn how the team manages patients’ pain, as well as about advanced directives, spirituality at the end of life, and grief and bereavement.

After volunteers complete the training, they are accompanied for a while by an experienced volunteer until they are comfortable seeing patients on their own.

“I don’t do it to collect any rewards,” explains Cecilia Hoyt, another No One Alone volunteer. “I do it out of the need to love and help those people and be able to make life a little more comfortable, easier. . . . It helps you to grow and mature and look at life through different eyes.”

Both Hoyt and Stern have also spent time with families of patients near death. Once, says Stern, she was with a mother as her young son was taken off life support. “I literally had to hold her up,” Stern says. “But we got through it—she got through it. . . . I felt that day like—I don’t know how I felt, but I knew I had made a difference.

Guts: “I’ve been learning how to put death in its place as part of our being,” she adds. “I’m learning grace from people that I see. That word keeps coming out—it’s grace. And guts.” One patient she spent a lot of time with, Stern adds, “I used to call . . . my Xena warrior princess.”

MATTHEW C. WIENCKE

THEN & NOW

A reminder of the pace of change, and of timeless truths, from the 1981 DHMC Annual Review:

“Hemodialysis, the use of an artificial kidney machine to remove toxic wastes from a patient’s bloodstream, has extended life for thousands of people whose kidneys have failed. . . . ‘As recently as 24 years ago, if both kidneys failed the person was sure to die,’ stated Frederick Appleton, M.D., medical director, Dialysis Unit. . . . A five-station hemodialysis unit opened at Mary Hitchcock in November 1980.”



>150

Radius in miles of the area from which the DHMC Chronic Dialysis Unit currently draws patients

10

Number of specialists in kidney disease and transplantation at DHMC



MARK WASHURN

Cecilia Hoyt, left, is active at DHMC in one of the nation’s few hospital-based palliative-care programs to use volunteers.