

New DMS students take up studies in several disciplines

One hundred and forty-two new students began their studies at DMS this fall—66 of them on the M.D. track, five in the M.D.-Ph.D. program, 33 in the biomedical sciences, and 38 in the evaluative clinical sciences.

Future M.D.s: Those admitted to the M.D. Class of 2003 sported not only the highest grade point average in the institution's history—3.6 in both the sciences and the non-sciences—but also the highest average physical science Medical College Admission Test (MCAT) score ever. That is despite a slight drop in applications, mirroring the downward trend in medical school applications nationwide. This year, DMS received some 6,200 applications, compared to 7,200 last year. But that still works out to nearly 90 applicants for every place in the M.D. class.

The class was drawn from 24 states and almost 50 undergraduate institutions. Nine of the new students were born outside the U.S., while one came into the world only a few yards from DMS, at the old Mary Hitchcock Hospital. Slightly over half (54%) are women—well above the national average of approximately 40%—and 12% are from racial or ethnic groups underrepresented in medicine.

The most popular undergraduate major for the future M.D.'s was biology, but a third majored in non-scientific disciplines. Eleven members of the class hold

graduate degrees, including a J.D. and master's degrees in the evaluative clinical sciences, nutrition, biomedical engineering, and aeronautics-astronautics.

The 66 students who started on the M.D. track included 53 who plan to do all four years of medical school at DMS; 12 in the Brown-Dartmouth program, which offers two years in Hanover and two years in Providence, R.I.; and one M.D.-Ph.D. student who has been working on his doctorate in the evaluative clinical sciences and is now starting on his medical studies. (In addition, three M.D.-Ph.D. students who were admitted in earlier years and are still working on their Ph.D.'s will take part of the first-year M.D. curriculum this fall.)

Other programs: Dartmouth's M.D.-Ph.D. program, which was established in 1993, now has a total enrollment of 24—five of them new this fall. Applicant interest in this program has been solid, with 269 inquiries about the program received this past year, 91 applications processed, and 28 candidates interviewed. The five new students will all start by working on their doctorates in physiology, molecular and cellular biology, or pharmacology-toxicology and will embark on the M.D. portion of the program in subsequent years.

These M.D.-Ph.D. students join 33 other new graduate students enrolled in doctoral studies in the basic sciences—27 in molecular and cellular biology, plus three each in physiology and pharmacology-toxicology.

And DMS's Center for the

F A C T S & F I G U R E S

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DHMC burns 1.2 million gallons of fuel oil a year



DHMC uses 34 million kilowatt hours of electricity a year



DHMC contains 60 miles of air ducts
(enough to reach from Lebanon to Concord, N.H.)



And, in the *heart-warming* department:

DHMC benefits from nearly 50,000 volunteer hours a year



DHMC contains 350 plaques commemorating gifts of \$5,000 or more



The Association of American Medical Colleges has conducted public opinion polling on what determines patients' choice of a doctor. The following percentages of patients say these factors have a lot of influence on their choice:

- Recommendations of friends or family members: 87%
- Communicates well/caring attitude: 85%
- Ability to explain complicated medical procedures: 77%
- Good listening skills: 76%
- Board certification: 70%
- Accepting certain health insurance: 50%
- Years in practice: 32%

Evaluative Clinical Sciences (CECS) welcomed 38 new students this year—36 of them in the master's program and two of them new Ph.D. candidates. This brings the total enrollment in the CECS program, which was also established in 1993, to 71 students—54 working towards a master's and 17 pursuing a doctoral degree.

Array: The members of the M.D. class brought with them to Hanover a fascinating array of experiences. Director of Admissions Andrew Welch summarized the achievements of the '03s in addressing the class during orientation: "Members of the class are published in *Lancet*, *Cell*, *Genome Research*, . . . and the *Journal of the American College of Cardiology*. One of you was awarded a patent for your work in taxol research. . . . One of you was a member of the Research Ethics Board of Montreal's Royal Victoria Hospital.

"Seven of you have captained intercollegiate athletic teams," Welch added. "Three of you are All-Americans. One of you, who is also a four-time participant in NCAA championship tournaments, is an academic All-America. One of you is an NCAA All-Star in women's rugby, another the MVP award-winner at the sailing nationals. One of you is a three-time All-Ivy athlete who was New England champion in the 400-meter run. One of you rode a bicycle across the country, and another crossed the Atlantic in a 47-foot boat.

"Two of you are former Peace Corps volunteers. One of you worked as an Americorps volun-



FINING SQUIRREL GRAPHICS

These smiling faces belong to four of DMS's 66 new medical students, who joined another 78 new DMS students in three other degree programs.

teer. One of you was, for two years, a missionary in Quebec, and one spent a summer as a missionary in Nigeria. One of you deferred your entrance to DMS to accept a Rotary Ambassadorial Scholarship to study in Chile. One of you worked in a Women's Center in Dublin, another member of the class founded her undergraduate institution's chapter of Habitat for Humanity, while another founded his college's rescue squad.

"One of you is the former missile defense project manager at Hanscom Air Force Base. . . . One of you is a paratrooper who served as the medical organization officer for the Israeli Marine Corps. Another member of the class is a West Point graduate who served as an intern in [U.S. Representative] Susan Molinari's Washington office. One of you was a Parliamentary Aide in the British House of Commons.

"One member of the class was the concertmaster in his college's orchestra," Welch said, "another has worked as an art appraiser, [and] one of you was an appren-

tice to a stained-glass artisan.

"One member of the class managed \$7 million in assets at Smith Barney. One of you was a marketing associate at IBM."

Furthermore: "One member of the class was the youngest research associate at Genentech, one was a private investigator, one a hotel security officer, one worked as a counter agent for American Airlines, one as an appliance repair technician, one as an instructor for the National Outdoor Leadership School, and one as an assistant producer for World Affairs Television.

"One worked in the chicken houses of a kibbutz in the Negev, one worked as a farmhand on a Utah dairy farm, one was raised on a New Hampshire sheep farm, and one worked on the Leatherback Sea Turtle Conservation project in Costa Rica."

And, Welch concluded on a whimsical note, before the class buckled down to work on anatomy and physiology and biochemistry, "one of you owns a parrot named Nelson."

Sara Fisher

Jay Dunlap is tapped as first chair of new genetics department

With his ruddy complexion and reddish beard, Jay Dunlap looks like he'd be more comfortable working in the woods than in a sunlight-deprived genetics lab. But Dunlap is an award-winning scientist who has spent his career deciphering the internal clocks that regulate organisms as simple as bread mold and as complex as humans. A member of the DMS faculty since 1984, he is also the inaugural chair of the School's new Department of Genetics.

"Jay had academic credentials that were unexcelled," says DMS Dean John Baldwin, M.D., who made the establishment of a genetics department one of his priorities as dean. "He's an internationally recognized geneticist. He's also a person who knows the community well. It was clear he would embrace the concept to make this a College-wide effort."

Recruitment: Dunlap's first task is recruiting the people who will help him build the department. By the end of this academic year, he hopes to have hired several faculty members. And within five years, the goal is to recruit 12 to 14 new professors.

"The right thing to focus on is people," Dunlap says. "Ultimately, that's the resource that you're building. As long as you have people doing interesting things, they will bring with them the technology. So you want to have a department where people see through the trees of the forest and have picked interesting

questions." While a few of the new genetics professors will come from within Dartmouth, most will be brought in from other universities. "The geneticists that are here are certainly good enough," Dunlap explains. "But if they were pulled out of the departments that they were in, then that would simply impoverish those departments."

Cusp: At a time when not only medical journals but newspapers and television shows are filled with stories about cloned sheep and DNA paternity tests and the Human Genome Project, which will finish laying open the sequence of the human genome within the next five years, the DMS department arrives on the cusp of a new era.

"We're really beginning the golden age of human genetics," says Dunlap, who earned his Ph.D. in biology from Harvard and did postdoctoral work in molecular genetics at the University of California at Santa Cruz. "All of the great questions that were asked over the last 300 years about everything, about how living things work, you can get at now in ways that you just couldn't 50 years ago."

As an example, he points to the four causes of human illness—injury, infection, mental trauma, and genetic malfunction. Scientists have learned much about three of those causes in the past hundred years, he says: "In the 20th century, we've done a lot with being able to fix cuts and bruises. We've done a lot with being able to fix infectious diseases. And we're making progress with mental health. But



JOSEPH MEHLING

Jay Dunlap, a noted expert on the biological clock, has been selected as the chair of Dartmouth Medical School's new Department of Genetics.

many genetic diseases have been simply intractable. In the next century, we'll have a lot better handle on finding out what the nature of the problem is and what can or cannot be done to fix it."

Clocks: Meanwhile, Dunlap will continue his own research on biological clocks—work that won him a prestigious MERIT Award from the National Institutes of Health in 1998 and the Honma International Prize in 1991. After years of studying the bread mold *Neurospora*, Dunlap and his colleagues—including his wife, Jennifer Loros, Ph.D., an associate professor of biochemistry—have recently begun studying mice.

"We started working on mice, hoping to use what we know about a very simple model," explains Dunlap. "We've learned how to think about the problem pretty well. Now we can think about the problem in a much more complex system, which is thereby a lot closer to people."

Dunlap's work is widely rec-

ognized. Steven Reppert, a biological clock expert at Harvard, calls him "an outstanding geneticist. His research discoveries have been truly seminal, leading to a better understanding of how our biological clock works at the molecular level."

Dunlap and Loros were the first scientists to isolate and then to clone the genes that govern timekeeping. They have also investigated how light and temperature reset the clocks of plants and animals. In humans, the internal clock helps control blood pressure (it increases before we wake in the morning, so when we sit up we don't faint); sleep patterns; and even sensitivity to pain. Studying the biological clock also promises to help in understanding sleep disorders, depression, and jet lag.

As for the latter problem, there is currently no remedy. Dunlap should know: in mid-November, he returned from a speaking engagement in London feeling jet-lagged.

Kathleen Burge

Research funding increases by 10% for the second year

Research awards to DMS totaled over \$64 million in fiscal year 1999. The sum marked a 10% increase over FY98 and the second year of double-digit growth—a welcome turnaround from the decreases of a few years ago.

Adam Keller, associate dean and chief operating officer of DMS, gives the credit to the researchers themselves. He notes that long-time faculty members have been more aggressive and successful in winning external funding recently. "[They're] really turning up the level of research a full notch," he says.

Funding: Keller also credits the "recruitment of new faculty who are productive academicians." He points both to new young researchers—such as Drs. Steve Fiering in microbiology and Michael Spinella in pharmacology and toxicology, both of whom have secured funding since coming to Dartmouth—as well as to established researchers new to DMS. In the latter category, for example, are Drs. James Weinstein, who brought in \$2.5 million to study back pain, and Ethan Dmitrovsky, who was awarded \$1.1 million for various oncology projects.

Other principal investigators credited with \$1 million or more during FY99 were Drs. William Wickner, Allen Dietrich, E. Robert Greenberg, John Baron, Randolph Noelle, Eugene Nattie, Charles Wira, Robert Drake, Peter Silberfarb, and Harold

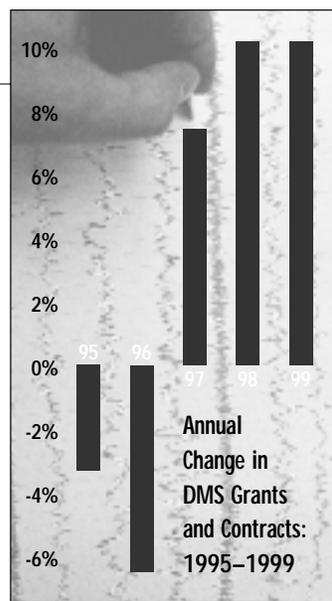
Swartz. Their work runs the gamut from molecular mechanisms to psychiatric services.

Over two-thirds of the awards came from the U.S. Department of Health and Human Services (HHS), which Keller sees as a "marker of our success and the quality of our research," given the competitiveness of the HHS system. In fact, DMS once again ranked above the 85th percentile among all medical schools in federal funding per basic science faculty member. But while Keller expects DMS to remain aggressive in pursuing HHS grants, he hopes to also develop more partnerships with corporate sponsors of basic research. Corporations accounted for about 10% of external funding in FY99.

Impact: The growth in awards represents more than just numbers on paper, however. It has a distinct impact on day-to-day life at DMS, benefiting students, patients, and the institution in general.

The increased funding has fueled expansion of the basic science graduate programs, meaning DMS now has more graduate students than ever before. This has created a cycle of growth in what Keller terms "the life of the laboratory." As he explains it: "Having young, excited minds there contributes to the research [and] having a really active research profile is what attracts those people to the institution." Keller adds that this also allows more undergraduates to serve research clerkships.

The benefit to patients comes from the expansion of clinical trials based at DHMC. Keller is



excited about Dartmouth's increasing capacity to run trials that "originated here, were written here, and are federally funded." For example, Keller points to the work of Drs. Randolph Noelle and Lloyd Kasper in using an agent Noelle discovered to treat multiple sclerosis (see page 7).

A final notable trend is the increased opportunity for collaboration within the Dartmouth community. And Keller anticipates even stronger ties between DMS and the College due to the recent establishment of a genetics department.

Looking to the future, Keller again focuses on the budding genetics department, which he believes will help to sustain the growth in awards. But he emphasizes that the "bottom line" is not the funding itself, but the research it makes possible. "We had such a phenomenal awards year last year," he concludes, "that I really expect a great year this year in terms of the actual research that gets done."

Jonathan Weisberg

Surgeon Steve Plume steps down from the Clinic presidency

After serving as president of the Dartmouth-Hitchcock Clinic for most of the 1990s—a decade that has seen significant national upheaval in medicine, both organizationally and financially—cardiothoracic surgeon Stephen Plume, M.D., has announced that he is stepping down from the administrative post. He plans to remain on the DMS faculty as a professor of surgery and will devote all of his efforts to patient care and research.

"I found myself spending more of my time proportionately on things I didn't enjoy nearly as much as the things that I used to do—like clinical surgery," Plume says.

Privilege: Yet he appreciates "the privilege of having leadership in this organization. I don't think there's any academic medical center in the country that has a better handle on the changes [in health care] that need to occur."

Plume, who joined the Clinic in 1977 and has been president since 1990, also plans to continue his involvement in quality improvement initiatives, a subject that he has lectured on internationally.

Quality improvement in health care systems has its roots in W. Edwards Deming's theories on total quality management as applied to industry. "Reflecting on how we practice," explains Plume, "is as important as prac-

tice itself. We need to find ways to build that into our daily work. To a certain extent, I found less time for that in the context of what's been labeled the Lahey debacle or the financial difficulties recently."

Stresses: Of the short-lived 1995-1997 merger between the Hitchcock Clinic and the Massachusetts-based Lahey Clinic, Plume comments, "It was a major disappointment that the Lahey combination didn't work. We thought it would be terrific to have a truly regional group practice."

But, he adds, "we just plain could not come to a comfortable, friendly, productive interaction with a minority of senior leadership. That fate has befallen others as well, so it's not a unique experience."

The Clinic also announced a \$20-million loss in its southern region for fiscal year 1998, another problem shared by many other academic medical centers. It was ascribed to internal inefficiencies, unfavorable managed-care contracts, and unprofitable physician practices that had been acquired in the Seacoast area (see the Winter 1998 issue of *Dartmouth Medicine*).

"The financial issues that have been so stressful for the last couple of years have certainly been disappointing," Plume says. "We are experiencing the stresses that every other health-care system in this country is experiencing."

Guidance: Nevertheless, Plume "has moved Dartmouth-Hitchcock Clinic forward in a quickly changing environment which

has seen many organizations challenged beyond their capabilities," commented F. Ray Keyser, Jr., chair of the Clinic Board of Trustees and former governor of Vermont, upon the September 10 announcement of Plume's resignation.

"His leadership and guidance for his colleagues throughout New Hampshire and Vermont," added Keyser, "have served as a model for success and have fortified for us all the notion of a non-profit group of physicians working to enhance health for patients and non-patients alike."

Plume was instrumental, for example, in the formation over a decade ago of the Northern New England Cardiovascular Disease Study Group, which today serves as a national model for improving cardiac care. The regional group consists of members from six northern New England medical centers and includes clinicians (from surgeons to nurses to anesthesiologists to perfusionists), as well as epidemiologists and administrators.

During the 14 months prior to his resignation from the presidency, Plume had been splitting his time between administrative oversight of the Clinic and work as a full-time cardiothoracic surgeon at Concord Hospital. A permanent medical director has now been recruited for that heart program, which is a joint venture between DHMC and Concord Hospital.

Plume will be stepping down from his administrative duties on a schedule to be determined by the Clinic's Board of Trustees. Until a successor is chosen, lead-



Steve Plume, president of the Clinic since 1990, has stepped down to focus on surgery and research.

ership will be provided by Plume; Thomas Colacchio, M.D., chair of the Clinic's Lebanon Board of Governors; and Carl DeMatteo, M.D., medical director of the Clinic's southern region.

Plume, a 1964 graduate of Harvard College, received his M.D. from the University of Rochester and did five years of surgical residency in Rochester and two years of cardiothoracic surgery training in Toronto.

Exemplars: "The nicest thing that's happened," Plume says, reflecting on his tenure in the leadership, "is to be able to bask in the reflected glory of some great work that other people around here have done. In many clinical and administrative arenas, folks at this institution have become nationally sought-after speakers, exemplars, and coinvestigators across a surprising number of disciplines.

"The Dartmouth trademark of trying to improve care is one that we together created."

Laura Stephenson Carter

JON GILBERT FOX

Friend or foe? Noelle probes the immune system

When the body's immune system, which normally combats invasion by "foreign agents," is instead directed against the body itself, a phenomenon called autoimmunity ensues. Hundreds of thousands of Americans are afflicted by autoimmune diseases, including multiple sclerosis (MS) and lupus.

Renegade: The course of an autoimmune disease is unpredictable but is typically characterized by flare-ups and remissions of varying degree and duration; symptoms range from minor to life-threatening. The key to finding a cure for these potentially debilitating illnesses is understanding what causes a friendly immune system to turn against the very body that it's supposed to protect. Randolph Noelle, Ph.D., a professor of microbiology at DMS, after years of investigation, is uncovering the secrets of, and developing novel strategies to counteract, a renegade immune system.

The immune system operates like the body's "Central Intelligence Agency," constantly assessing who is friend and who is foe. When a foreign substance is identified, an elaborate system is set in action to target and eliminate intruders. Unfortunately, just as in the cloak-and-dagger world of espionage, the immune system is occasionally infiltrated by "double agents."

In the case of autoimmunity, one such double agent—CD40L

(CD40 ligand)—has been identified by Noelle's lab. CD40L molecules are found primarily on the surface of white blood cells known as T cells. They control two facets of the immune system: they instruct another class of white blood cells, the B cells, to start producing target-specific antibodies; and they tell macrophages (which patrol the body and engulf foreign invaders) to initiate an inflammatory response, dilating blood vessels and attracting more macrophages to an infected area.

Normally, CD40L molecules regulate antibody production and macrophage activation so only foreign agents are targeted. Sometimes, however, for reasons not yet fully understood, CD40L sends the wrong signals to the B cells and macrophages. This can lead to the production of antibodies that attack and destroy the body's own tissues or to an overactivation of macrophages, and in turn to an autoimmune or inflammatory disease.

MS, for example, results when antibodies attack the fatty sheath that insulates nerve cells, affecting a person's ability to make smooth, rapid, coordinated movements. The mechanisms are different in other autoimmune diseases, but the effects are similarly devastating.

The strategy proposed by Noelle to counter the ill effects of unfriendly CD40L is simply to block the transmission of its signals to B cells and macrophages. Ironically, the blocking agent of choice is itself an antibody molecule—one raised in an animal—against human CD40L.

However, before an animal antibody can be introduced into a human patient's body, it must first be disguised so it won't be recognized as a foreign agent.

The disguise Noelle uses involves combining the anti-CD40L fragment of the foreign anti-

body with what's called the constant fragment of the human antibody molecule. (An antibody comprises a "constant fragment" and "antibody fragments." The constant fragment forms the major portion of the molecule and is identical for all antibodies of a particular class. The smaller, variable antibody fragments determine each molecule's specificity.) This procedure is called humanizing the antibody.

Principle: Noelle has already demonstrated that the principle works in mice. Using this approach, mice have been successfully treated for MS, lupus, inflammatory bowel disease, and rheumatoid arthritis. What is more, in some cases, a brief treatment appears to be sufficient to confer long-term protection. A joint study by researchers at DMS and Northwestern showed that treatment with anti-CD40L antibody can help to prevent relapses as well as reduce the severity of symptoms in mice.



FLYING SQUIRREL GRAPHICS

Randy Noelle has identified an antibody molecule that may help to treat MS and other autoimmune diseases.

The next step is human clinical trials. Noelle is careful to stress that while the studies in mice have been encouraging, what works in an animal model is not necessarily as effective in humans. Currently, neurologist Lloyd Kasper, M.D., and pathologist William Hickey, M.D., are heading a Phase I clinical trial, assessing the safety of humanized anti-CD40L antibodies. If the method proves safe, then a Phase II trial, assessing the treatment's effectiveness, is anticipated to begin sometime in 2000. A nationwide study is also underway to determine the concept's safety and effectiveness in patients with active lupus. The next step would be testing it against other autoimmune diseases. It could even be used to counter the rejection of transplanted organs and tissues.

"The potential of this technology may be extremely significant," Noelle says.

Martin A. Grundy, Ph.D.

Physiologist North: Exploring the many faces of vasopressin

One of life's lessons, often learned in college, is that you don't really buy beer, you sort of rent it. Consumption of a Foster's lager, imported from Down Under in generous 25-ounce cans—which Dartmouth physiologist William North, Ph.D., would probably call "Australian thimbles"—leads sooner rather than later to urinary urgency. That college student may also learn in a science class that this phenomenon is due not so much to the major but inert component of beer—water—as to its biologically active ingredient, ethanol. Of the many effects that ethanol exerts on the brain, among the less desirable is its ability to suppress the secretion of the antidiuretic hormone vasopressin, which regulates urine formation.

Up from Down Under: Bill North was born in New South Wales and received his Ph.D. from the University of Queensland. He came to the United States in 1972 with the idea of staying for three years. After two years at the Mount Sinai School of Medicine in New York City, he joined DMS physiologist Heinz Valtin, M.D., in Hanover for what was to be a one-year stay. That one year has been parlayed into a quarter-century.

At the time, Valtin's laboratory was developing the now-world-famous Brattleboro rat as an animal model to study human diabetes insipidus. The Brattle-

boro rat is born with a permanent problem somewhat similar to the temporary one in a Foster's drinker, in that it does not produce enough vasopressin to allow it to conserve its body water. Much of the life of these animals is taken up by trying to consume enough water at one end to make up for losses at the other. North began studying methods to extract and assay vasopressin as well as oxytocin and neurophysins, peptides found in association with vasopressin.

Marker: In the late 1970s, North ran across a paper on the possibility that vasopressin might constitute a useful marker for small-cell carcinoma of the lung. The paper's authors had arrived at their conclusion through mathematical extrapolations, which purported to show that tumors weighing several grams could be detected by measuring plasma vasopressin. By the time a tumor is that size, however, it can be detected by many other means and it is usually too late for effective intervention. The investigators concluded that vasopressin was thus not an effective plasma marker for small-cell carcinoma.

But when North went over the calculations, he found an apparent error of several thousand-fold. He got some mathematically savvy colleagues to confirm his suspicion, and recalculation indicated the possibility of detecting tumors of less than a few milligrams—a much more favorable stage in tumor growth for meaningful treatment. North went on to use not only vasopressin but also neurophysins as plasma tu-

mor markers. Such was his enthusiasm for the subject that medical students dubbed him "Dr. Neurophysin." Although he continued to make many other fundamental contributions to the basic biochemistry and physiology of the neurohypophyseal hormones, the possibility of their use as tumor markers was a concept that gradually came to dominate his research.

Synthesis: When North first came to Dartmouth, vasopressin was thought to be synthesized only in the hypothalamus. Today it is known to be made in the ovaries, uterus, adrenal gland, lungs, and gastrointestinal epithelium as well. Moreover, its physiological effects are not limited to antidiuresis at the level of the renal collecting duct.

The hormone's name, vasopressin, was originally chosen because of its potent effects at vasoconstriction—narrowing of the blood vessels. It also serves as a neurotransmitter in the central nervous system, where it plays a role in the secretion of adrenocorticotropic hormone (ACTH) as well as in the regulation of cardiovascular and visceral functions and of body temperature, all via central mechanisms. In addition, through effects on both coagulation factors and platelets, it plays a role in the blood-clotting mechanism.

Vasopressin is synthesized in breast tumors as well as small-cell tumors, types of cancer that share few other characteristics except that both arise from epithelial cells. Other common types of lung cancer do not produce vasopressin, but some tu-

mors unrelated to breast or small-cell do produce it.

Early on, skeptics suggested that the tumor cells may simply accumulate vasopressin synthesized in other sites instead of actually producing it themselves.

However, North proved that the vaso-

pressin gene is indeed expressed in the tumor cells. He was able to identify tumor-specific surface antigens that resulted from this gene expression, and he showed that these antigens could serve as targets for tumor immunodiagnosis. These antigens are also likely targets for tumor immunotherapy.

Peptides: What role do vasopressin and other related peptides play in tumor biology? Says North, "The simplistic answer is that they probably function as growth factors; in fact, vasopressin and other neuropeptides have been shown to promote the growth of breast cancer. However, I believe that these peptides may subsume many other functions in tumor cells, just as we now know they have many different physiological roles. For example, we have found all four known vasopressin receptors in these tumors, and each activates a different molecular train of



FIXING SQUIRREL GRAPHICS

DMS physiologist Bill North has been at Dartmouth since 1974, studying the neuropeptide vasopressin.

events. One type of vasopressin receptor may inhibit cell growth, even as another promotes it. Moreover, tumors also produce many other neuropeptides, which probably also have important functions that have not yet been elucidated, and which might also be used as tumor markers.

"I don't think that vasopressin is necessarily the most important peptide in the world," North admits, even though it is the most intensively studied of all the neuropeptides. "Chemists have run amok," he explains, "in synthesizing new vasopressin agonists and antagonists, including some exciting antagonists that are not peptides."

In fact, he says, "an effective vasopressin antagonist might turn out to be either an effective anticancer drug or a chemopreventive agent for tumors that depend on its availability."

Roger P. Smith, Ph.D.

The profit motive: What does it do to the cost of care?

Is it more economical if hospitals are run on a nonprofit or a for-profit basis? With 192 nonprofit hospitals having converted to for-profit status between 1990 and 1996, that question is far from hypothetical.

On one side of the issue are those who feel that investor-owned organizations offer more efficient health care; on the other side are those who think that for-profits are less concerned about quality health care than about keeping stockholders happy. What's the truth?

The truth is there's a lot at stake, and the evidence has been mixed. But an unusual collaboration among three Dartmouth researchers has provided substantial new information, while also stirring up a hornet's nest of controversy. Published in the *New England Journal of Medicine*, the study found that during a six-year period, for-profit hospitals billed Medicare more per capita than did nonprofit hospitals. Not only was spending higher in areas dominated by for-profits, but the rate of increase over the years was higher as well.

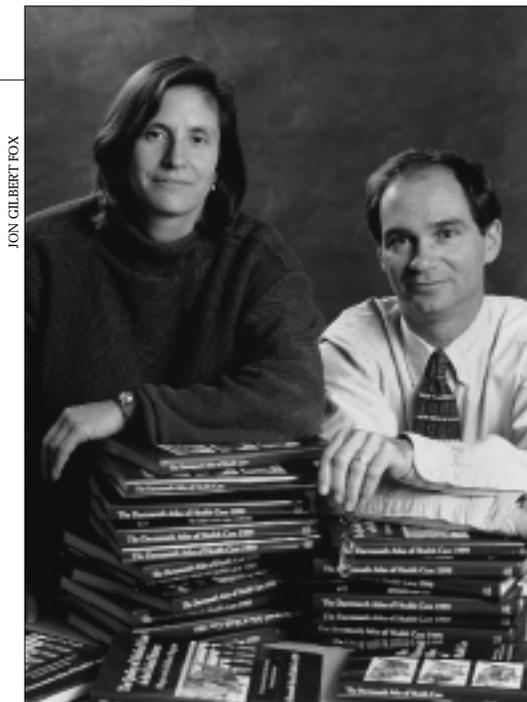
More costly: "The for-profit hospital service areas were more costly in each year, and that difference actually increased over the six-year period," explains Elaine Silverman, M.D., one of the authors of the study. A general medicine fellow at DMS, she is based at the VA Medical Center in White River Junction, Vt.

Using the *Dartmouth Atlas of Health Care* and national Medicare data from 1989, 1992, and 1995, the researchers compared overall costs in for-profit, nonprofit, and mixed hospital service areas, as defined by American Hospital Association surveys. After controlling for variables that influence spending—such as age, sex, race, region of the country, number of hospitals, Medicare mortality rate, and number of physicians per capita—they used computer programs to churn out a regression analysis.

Consistent: “Although we may not have measured every little aspect of the hospital service area, we measured three points in time, and it was a consistent finding,” explains Silverman.

Because previous research on health-care costs has been indecisive on the question of which are more economical, for-profit or tax-exempt institutions, the Dartmouth researchers decided to ask the question a different way. “Ours is the first study that looked from the perspective of the population,” explains Elliott Fisher, M.D., also an author of the study. He and the third author, Jonathan Skinner, an economist at Dartmouth College, had done previous work together on the *Dartmouth Atlas*.

“Most studies in the past have looked simply at unit cost—the cost per hospital-day or the cost per admission,” explains Silverman. “And in fact, most work has found that for-profit hospitals have been more expensive even in that definition, but some have found no difference. . . .



Elaine Silverman, a general medicine fellow at DMS, and Jonathan Skinner, an economist at Dartmouth College, pictured here, plus a third colleague, Elliott Fisher, represent an unusual research collaboration. They used data in the Dartmouth Atlas of Health Care to compare costs at for-profit and nonprofit hospitals.

The new ground we wanted to address is looking at the population of Medicare patients in a given area and seeing not only what was happening to hospital spending, but spending for home-health services and physician spending in other facilities, such as nursing homes.”

What they found was that in 1989, mean, adjusted per-capita spending in for-profit areas was \$4,006, or \$452 more than in nonprofit areas. By 1995, the for-profit total was \$5,172, or \$732 more than nonprofits. In each category of service examined—hospital services, physicians’ services, home-health care, and services at other facilities—for-profit spending was greater. And in the 33 areas where all hospitals had converted from non-

profit to for-profit ownership, spending grew faster than in the areas where all the hospitals remained nonprofit.

But is it possible that patients received more or better services for the extra cost? The current study wasn’t designed to answer that question.

“We can’t say whether quality is any different,”

says Silverman. “Our best assumption is that there’s no difference, in which case they’re [just] spending more money, but we’d have to look further to see.”

As might be expected, advocates of investor-owned hospitals were not pleased by the study’s results, which were immediately spread nationwide by the *Wall Street Journal*, the *Los Angeles Times*, Associated Press, and National Public Radio. Critics complained that for-profits were doing better at cost containment than the study indicated.

Taking sides: “Some people come down pretty hard on one side or the other on the role of business in medicine,” explains Silverman, who concedes the limitations of the study but confidently defends it against the at-

tacks made by supporters of for-profits. “Although we cannot say from our study the definite mechanism, we can say that in the for-profit areas, all of the costs were higher on average per Medicare enrollee.”

Silverman hopes to do more research to shed light on why for-profits are more expensive. She also wants to look more closely at service areas where there are both for-profit and nonprofit hospitals, where the cost difference is less clear-cut, and where competition may be playing a constructive role.

The researchers also want to analyze more recent data to find out if spending trends have changed since 1995.

Collaboration: The team has an edge in the fact that it represents an unusual collaboration among the VA Hospital, the Medical School, and the College. The mix of disciplinary expertise and the access to various knowledge bases has fostered a creative atmosphere in which to analyze the thorny questions related to spending.

“I didn’t think when I started the fellowship that I’d be working with an economist,” says Silverman, who began her fellowship in 1997, after working as a general internist for the Hitchcock Clinic in Concord.

Fisher hopes that communities will take the results of this study to heart and ask some serious questions before embracing for-profit ownership of hospitals. “We see it as a piece of evidence,” he cautions, “that might temper people’s enthusiasm.”

Lee McDavid

Race in cardiac care: DMS researchers warn that statistics can lie

History's most vivid caution against the careless use of statistics probably came from the much-quoted British politician Benjamin Disraeli. "There are three kinds of lies," he said. "Lies, damned lies, and statistics." A trio of DMS researchers used much more restrained language but made basically the same point in commenting recently on a widely publicized study regarding the impact of race on the care recommended for patients with symptoms of cardiac disease.

The saga began with a February 25 article in the *New England Journal of Medicine* that reported a significant gap between the rates at which blacks and whites are referred for cardiac catheterization. The study—whose lead author was Kevin Schulman of Georgetown—asked internists to watch videotapes in which actors of both races portrayed chest pain and other cardiac conditions, and then assessed the frequency with which the doctors referred the "patients" for diagnostic catheterization.

Apparent bias: The article, titled "The Effect of Race and Sex on Physicians' Recommendations for Cardiac Catheterization," with its apparent findings of bias in cardiac care, was hot fodder for the nation's major newspapers and was also featured on ABC's *Nightline*. With headlines like "Heart Care Reflects Race and Sex, Not Symptoms" (*USA*

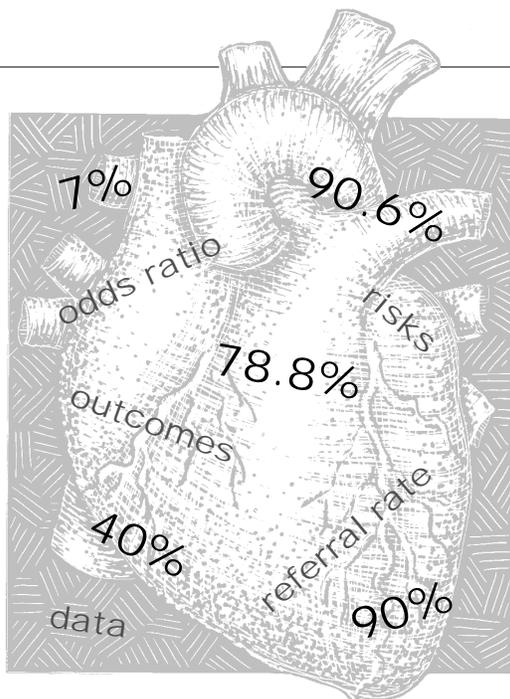
Today), "Heart Study Points to Race, Sex Bias" (*Los Angeles Times*), and "Doctor Bias May Affect Heart Care, Study Finds" (*New York Times*), the Schulman paper attracted widespread attention.

It was the *Nightline* broadcast that brought the study to the attention of DMS faculty members Lisa Schwartz, M.D.; Steven Woloshin, M.D.; and H. Gilbert Welch, M.D. Their work focuses on outcomes research, and the Schulman study raised some questions in their minds.

Misunderstandings: The DMS trio dug into the study's data and published a follow-up article—titled "Misunderstandings About the Effects of Race and Sex on Physicians' Referrals for Cardiac Catheterization"—in the July 22 *New England Journal*.

Welch says their article was more than simply a response to the Schulman paper, although that study "happened to have a number of very good examples of what we would say was really misleading." The DMS team wanted "to help reporters be more critical consumers of data and to encourage researchers to be more forthright in their display of information."

The differing rates of referral



SUZANNE DEBOHN

of cardiovascular-associated mortality." The DMS response emphasized that "exaggeration of the data does nothing to advance the fight against discrimination on the basis of race or sex; indeed, it arguably aggravates the problem."

Implication: Another problem with the original paper, pointed out the DMS trio, was that it aggregated the data by race and sex rather than breaking it down for black men, black women, white men, and white women—thus implying that all blacks were referred less often than all whites and that all women were referred less often than all men.

In fact, when the DMS team analyzed the data, it was clear that black and white men and white women were referred at the same rate (90.6%), and that only black women were referred at a lower rate (78.8%).

In addition, according to Woloshin, "the big difference between the black women and everyone else really boils down to the rate of referral for one actress—[an] older black woman. It turns out that she was referred less often than anyone else." Schwartz, Woloshin, and Welch do agree that the Schulman study "raises questions about differential treatment of black women and that the most reasonable approach is to take a second look."

Appropriateness: The DMS team also raised a third question. Among the findings of the original study was that "overall, almost 90% of the patients were referred for catheterization"—a rate that Schwartz and her col-

reported in the original article were widely interpreted in the media as demonstrating that blacks and women were "40% less likely" to be referred for cardiac testing than whites or men. In fact, blacks were referred only 7% less often than whites.

According to the DMS team, Schulman and his colleagues "chose to summarize the relative chance of referral for blacks as compared with whites using an odds ratio—literally, the ratio of the odds in favor of being referred for catheterization for blacks to the odds for whites." The media, in turn, "presented relative measures of difference when comparing the referral rates for blacks and whites, but failed to report the absolute rate of referral for each group."

The use of odds ratios "overstated the magnitude of the differences observed . . . and thus influenced the characterization in the media . . . that lower referral rates explain higher rates

leagues found to be “implausibly high,” given growing concern about the technique’s side effects. The media, however, referred to catheterization as “the most sophisticated examination” and “the most aggressive treatment,” without questioning whether this invasive diagnostic tool is, in fact, universally appropriate.

In other words, the media’s implication was that because blacks and women were referred for catheterization less often, their care was inferior. But the DMS rebuttal noted that neither the original study nor the media indicated that catheterization involves real risks, and that outcomes research strongly suggests that “more treatment is not always better and can actually be harmful.”

As Schwartz, Woloshin, and Welch point out, “If the research community does not get it right, we cannot expect the media to do better.”

Coverage: After their follow-up article was published, the DMS trio was interviewed on National Public Radio, a story went out on the AP wire, a number of newspapers carried corrections, and *Brill’s Content*, a media watchdog publication, ran an article on the matter.

Although ABC’s *Nightline* declined to run a correction, Peter Jennings of ABC News briefly mentioned that “sometimes we get things wrong.” A few reporters also called the DMS team in an effort to understand the problem better. Wrote *USA Today*’s health and education editor: “Some of these statistical

comparisons are pretty hard to convey. . . . Unfortunately, we have to take our cues from the experts.”

Impact: It is actually these “experts” whom Schwartz, Woloshin, and Welch were hoping to reach. And in that, they appear to have succeeded. For example, in an unusual gesture, the executive and associate editors of the *New England Journal of Medicine* stated in the correspondence section of the *Journal*: “We take responsibility for the media’s overinterpretation of the article by Schulman and colleagues. We should not have allowed the use of odds ratios in the abstract. . . . Although racism and sexism are prevalent in American life, the evidence of racism and sexism in this study was overstated.”

According to Welch, “the biggest impact we’ve had is with the *Journal*, and, of course, that spills over to the rest of the world. The *Journal* is on the lookout for odds ratios and making sure they’re not interpreted as relative risk. I’ve seen direct evidence of that in subsequent papers.”

Although he and his colleagues feel their follow-up article got much less media attention than the original study did, they were pleased by the *New England Journal*’s response. “They published our work, which certainly was not flattering to their work, and they went the extra step of acknowledging it themselves,” concludes Welch.

“It has clearly changed their policies,” he says, “and that’s worth something.”

Sara Fisher

MEDIA MENTIONS :

Among the people and programs coming in for prominent media coverage in the past few months was a DMS study which revealed that, according to *Kiplinger’s Personal Finance Magazine*, “many people whose health insurance covers preventive screening are not taking advantage of it.” For example, “using Medicare data . . . the researchers found that only 28% of women ages 65 to 69 received a mammogram during 1995 and 1996, even though experts recommend that women in that age group get screened once every two years.” Dr. Jonathan Lord, formerly chief operating officer of the American Hospital Association and now an adjunct professor of community and family medicine at DMS, was quoted as saying that “the country’s health-care system needs to develop a way to monitor preventive care. . . . And, Lord says, patients need to take an active role.”



The *New York Times*’s Gina Kolata recently explored the ethical issues raised by embryo research: “If you can grow a mouse from a single embryo cell,” she wrote, “you should in theory be able to grow a human from a single embryo cell. And if you can grow a human from a single embryo cell, is that cell the moral equivalent of an entire embryo? Where, in other words, does the potential for human life lie? There are no simple answers anymore, ethicists say.” One of the ethicists she quoted was Ronald Green, director of Dartmouth’s Ethics Institute. “The problem, said Green, is that people are still trying to use biology to draw moral lines in the sand, and biology just does not suffice anymore.”

The incidence of bacterial meningitis on college campuses received wide coverage recently. The *Wall Street Journal* explored the meningitis vaccine’s benefits, limitations, and cost implications (since many insurance programs don’t cover its \$60 cost), noting that “the Centers for Disease Control’s influential Advisory Committee on Immunization Practices will consider recommending whether the evidence warrants recommending the vaccine for groups at risk. ‘If parents want to provide a bit of extra protection, and it’s worth spending \$60, it’s a reasonable choice,’ says John Modlin of Dartmouth-Hitchcock Medical Center, who heads the advisory committee. ‘But I’m not sure it makes sense from a public health standpoint.’”



In a recent op-ed essay published in the *Washington Post*, Patrick Hays, the president and CEO of the national Blue Cross and Blue Shield Association, invoked the work of the director of DMS’s Center for the Evaluative Clinical Sciences: “In recent congress-

D M S & D H M C I N T H E N E W S

sional testimony, Jack Wennberg, a Dartmouth College health quality expert, said, 'When medical science is weak, medical necessity is commonly determined by the opinions of local providers. One result is that patients with the same conditions are treated very differently, depending on where they live. What is medical necessity in one community is unnecessary care in another.'



A feature in *U.S. News & World Report* on back pain—which afflicts four out of five Americans at some point in their lives—reported on a patient who had found satisfaction at DHMC. "Boston lawyer and avid runner Jonathan Fitch fell to the floor after moving furniture and suffered . . . pain radiating from his back down through his leg. . . . Several doctors told him not to run and two physicians recommended different surgeries. . . . Fitch was hesitant, and so was James Weinstein, director of the Spine Center at Dartmouth-Hitchcock Medical Center. 'I told him not only that he *could* run but that he *should* run,' says Weinstein. . . . Two years later, [Fitch] still has not felt the need for surgery. Last March, he ran the Boston Marathon."



"For some children, it's an after-school pressure cooker" was the headline on a *New York Times* feature about the activity-filled—even stress-filled—lives that many school-aged children lead. One of the experts the *Times* turned to was Dr. Marcia Herrin, codirector of Dartmouth's eating disorders program, who "said there was a connection between overscheduling and the development of eating disorders. 'I see a lot of teenagers who have no discretionary time,' Dr. Herrin said. The connection between eating disorders and activities appears to be strongest with sports."



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The Pokémon craze—the toy world's latest collectible and game fad—was recently analyzed by the *Boston Globe*. "Dr. Steven Atkins, a child psychologist at Dartmouth Medical School, [expressed concern] about the money involved in the fad, especially for children from poor families who want to fit in. But he's not bothered by the game itself. 'From what I see, it's interactive, they're socializing, strategizing. Anything that has kids talking together is a good thing.'"

Only one-third of patients who tested positive for colon cancer obtained two recommended follow-up tests, according to a recent study conducted under DMS auspices. The Associated Press covered the study results, noting, "Failure to obtain proper follow-up testing could delay discovery of the disease, and 'the later you find it, the more difficult it is to cure,' warned one of the researchers, Dr. Jon Lurie of the Veterans Affairs Medical Center in White River Junction, Vt.," an assistant professor of medicine at DMS.



The *Chronicle of Higher Education* recently profiled Dr. Lori Arviso Alvord. The nation's first Navajo woman surgeon, she has been at DMS since 1997 as a surgeon and the associate dean of students. "Dr. Alvord, whose father was a Navajo and whose mother is white, has spent her life straddling the two cultures. Now she is helping to teach a new generation of medical students about melding the high-tech world of Western medicine with the holistic, spiritual approach she learned from her tribe's elders." The story noted the importance of role models. "She was fascinated by the human body, but inhibited by a Navajo culture that respects personal boundaries and disapproves of touching. . . . With the support of an American Indian surgeon who served as her mentor, she pursued the career that has led her to one of the nation's premier academic medical centers."



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Community school a repeat success down in Manchester

Motility wasn't on the syllabus, but DMS faculty used it to good effect this fall when they took the popular Dartmouth Community Medical School on the road to Manchester, N.H.

Students of all ages filled a hall at Saint Anselm College for seven Tuesday evenings to learn more about the building blocks of life, to better understand the science behind many chronic illnesses, and to glimpse the future of biotechnology.

"People really do have a strong interest in health care and the related sciences," says John Sanders, M.D., a cardiothoracic surgeon who was one of the instructors. "Particularly with news articles, magazines, the Discovery Channel, and the Internet, they're probably better informed than ever—but don't necessarily have a good idea of what's valid and what's not valid."

Commitment: To fill that gap, DMS Dean John Baldwin, M.D., initiated the Community Medical School, a mini version of medical school for a lay audience. The inaugural session in Hanover last spring drew 300 people for weekly lectures on genetics, cancer, and heart surgery, to name a few of the topics covered. As part of its commitment to public education, DMS decided to repeat the course in Manchester this fall; 150 people paid \$15 to sign up.

On the first night, Sheila Evjy of Windham, N.H., arrived

about 15 minutes early. "I was amazed," she says. "There were almost no seats left." The retired vice president for nursing at Manchester's Elliot Hospital, she signed up because she was curious about how health-care organizations reach out to the public these days. "It's a lot more difficult for the average person to go to the library to get this information in some kind of form that will make sense without plowing through text for hours and hours," she says. "I think it's evident from the number of people who were there that there's a need for this."

State Senator Leo Fraser of Pittsfield, N.H., would probably agree. As a legislator, he's been involved with health-care issues for years. As a Community Medical School student, he has gained a better understanding of how the human body works, which he can apply to his work in the State House. "I'm going to be more comfortable listening to testimony on medical issues," he says. And personally, Fraser wanted to learn more about cancer, having lost his wife to breast cancer nearly a year ago. "It's no secret that the most devastating disease is cancer," he says.

Syllabus: For the most part, Community Medical School organizer Donald St. Germain, M.D., duplicated the successful Hanover syllabus in Manchester. However, he tinkered with the program a bit in response to feedback. In Manchester, balky audiovisual equipment wasn't a problem, and lecturers toned down the "blood and guts" visuals that some Hanover class

JOSEPH MEHLING



Don St. Germain, pictured at the lectern during last spring's series of Community Medical School classes in Hanover, found just as receptive an audience when he transported the course southward to Manchester this fall.

members felt were too graphic.

And instead of small-group discussions on cancer treatment, the Manchester students heard a talk on skin cancer by Robert Willer, M.D., chair of dermatology and medical subspecialties at the Dartmouth-Hitchcock Clinic in Manchester. St. Germain says the small groups were too difficult to organize on the road.

"For the most part, the feedback was very, very positive," St. Germain says. "The guidance we got from our Hanover audience was 'Keep going.'"

Andrew Richards, a sophomore at Central High School in Manchester, was glad his mom had told him about the course—and that she was willing to drive him to Saint Anselm every Tuesday night. "I've found it very interesting," Richards says. He tried to persuade some of his friends to come, but "a lot of people that I hang out with want to be lawyers." Instead, Richards, who is thinking about being a doctor, talked his biology teacher into attending a few classes.

The Community Medical

School will return to Hanover in the spring of 2000 with a new curriculum. Information on the course will be advertised in the press and posted on www.dartmouth.edu/dms/dcms/broch_frnt.htm, as it is available.

Service: Surgeon Sanders is ready to sign on again as an instructor. "I think it does a real public service, number one, but it's also good for the institution. . . . Physicians should be primarily educators of patients and families and help them make decisions about their care."

If the course returns to Manchester, Fraser hopes to be there again. An avid New England Patriots fan, he can see applications for his newfound medical knowledge beyond the capitol. "I hear a lot about knee injuries and ACLs," he says. "I would like to learn more about fractures."

As St. Germain is fond of saying, Dartmouth Community Medical School can help people become more informed patients. And, if Fraser has his way, more informed fans as well.

Julie Warwick

DHMC discovers that recycling makes good sense and good cents

The logic is inescapable, according to James Varnum, president of Mary Hitchcock Hospital: "Hospitals across the country each day work hard at improving health in their communities, yet they generate two million tons of waste a year, some of it very toxic. If we pollute our neighborhoods with poor waste-management practices, we contribute to the very health problems we're committed to curing."

Awards: Back in 1990, the focus of DHMC's environmental programs was on regulatory compliance. Since then, it's expanded from meeting minimum standards to being one of the best hospital waste-management and recycling programs in the country. Proof lies in three major awards in less than two years:

- A few months ago, in Concord, N.H., DHMC was presented with the 1999 Governor's Award for Pollution Prevention, for a yard-long list of "pollution prevention successes."

- In May of 1999, at the National Press Club in Washington, D.C., DHMC was given the "Making Medicine Mercury-Free" Award by Health Care Without Harm, which calls itself "the campaign for environmentally responsible health care."

- And on Earth Day 1998, in Boston, DHMC was the only hospital to receive the EPA's annual Regional Environmental Award, for being "an outstanding environmental advocate"

and applying what the EPA's John DeVillars called "good old Yankee ingenuity in addressing many of New England's most pressing and complex problems."

All new: Things were different before DHMC's 1991 move to the Lebanon campus, says environmental programs coordinator Laura Brannen. At the old Hanover site, with each department managing its own hazardous materials, "all sorts of nightmarish things could accumulate under sinks, in closets, in cabinets. Moving to the new Medical Center presented us with a wonderful opportunity to start fresh, and design and install all new systems."

For example, construction plans called for a new medical waste incinerator, but "no one knew how much waste we generated: how much hazardous chemical waste, infectious waste, waste to be sterilized, or even how much solid waste went to the landfill." Enter consultant Victoria Jas, hired to do a detailed waste audit. Today, Jas is still at DHMC, as manager of biosafety and environmental programs, joining Brannen, who handles DHMC's hugely successful recycling program and pollution-prevention initiatives, and Mike Brown, a hazardous materials technician. Collectively, the three deserve much of the credit for DHMC's award-winning performance.

Most hospitals incinerate their solid waste. Yet despite the clean-air legislation of the past two decades, almost 70% of hospital incinerators have no pollution-control devices. In an era



JON GILBERT FOX

Laura Brannen's job involves making sure that as much of DHMC's waste stream as possible ends up in recycling bags and bins—not in the landfill.

when nonreusable plastic instruments constitute a large part of hospital waste, incineration poses a potential public health hazard because it releases two major toxins: dioxin, the world's deadliest known carcinogen, from plastics containing polyvinyl chloride (PVC); and mercury from instruments like thermometers and blood-pressure devices. Although one thermometer contains only 0.003 pounds of mercury, that's sufficient to necessitate public warnings about consumption of fish in a 30-acre lake. Federal studies have confirmed that incineration is a major reason these highly toxic contaminants find their way into the nation's food supply, ending up in startling amounts even in processed baby food.

A survey of the nation's hospitals done by the nonprofit,

Washington-based Environmental Working Group (EWG) showed that over 40% of the top 50 hospitals polled were still incinerating waste that could be disposed of by a safer method. Only one in five had programs to reduce purchases of plastic goods containing PVC.

Irony: And ironically, even though the EWG survey found that four of five hospitals surveyed had mercury reduction programs, nearly half were still buying mercury thermometers and over half were still purchasing mercury blood-pressure monitors. DHMC, however, has replaced nearly all mercury-containing devices—thermometers, blood-pressure devices, electrical switches, and thermostats—with non-mercury alternatives.

In addition, DHMC now has two large autoclaves that sterilize

medical waste with superheated steam before it's incinerated. (Chemotherapy and pathology waste—a small percentage of the total—is sent to a commercial incinerator employing even more sophisticated pollution-control measures.)

Since 1996, through intensive employee-education, DHMC has reduced the amount of trash sent to the autoclaves from 35% to 12% of total waste. DHMC now recycles 30% of its trash, including materials like grease, linens, shrink-wrap, fluorescent bulbs, x-ray film, and silver. Infectious waste—whose disposal is both costly and labor-intensive—has been reduced from 36% to 14% of the total. In addition, Jas is overseeing a three-year effort to significantly reduce—and to ultimately eliminate—the use of ethylene oxide, a hazardous gas used widely in the sterilization of instruments. "It's all," says Brannen, "a matter of changing the culture."

"Environmental programs pay for themselves," she adds. "But although any hospital can hire somebody to look at their waste-handling situation, a thorough job can't be done without top-down commitment to the enterprise. Our waste costs have gone down because of the statement of environmental principles approved by the board of trustees and senior leadership."

Implications: "Every time a hospital employee makes a decision about where to throw trash, there are cost implications," Brannen explains. "A 30% recycling rate means well over 3,000 pounds of material a day doesn't

go to the landfill. Naturally, when recycling markets are strong, there are stronger financial incentives to recycle. But even when they're sluggish, recycling is still landfill cost-avoidance." Similarly, minimizing infectious waste (which is six times as costly to dispose of as ordinary waste) saves hundreds of thousands of dollars a year.

Evangelism: "It's our job to create a general awareness of how really easy these principles are to put into practice," she says. "Doctors aren't taught a thing about environmental health in medical school; neither are nurses. For the past two years, we've been meeting with incoming residents during their June orientation, briefing them on our programs, their role, and how this all ties in with environmental and human health. Regardless if they stay here or go on someplace else later, we hope they'll take this philosophy with them. . . . It's evangelism, really."

Brannen preaches this gospel all over the country, as does MHMH President Varnum. In a recent EPA-funded videotape, he encourages hospitals to follow DHMC's lead and "be real environmental stewards in their communities . . . meeting the highest environmental standards of all, while still providing the highest-quality health care."

"That's not to say we've figured it all out yet," Brannen cautions. "If you followed our dump truck to the landfill . . . you'd still see newspaper in there and glass and aluminum. But we're making a difference."

Mary Daubenspeck

**Worthy of note:
Honors, awards,
appointments, etc.**

Two associate professors of psychiatry were named presidents-elect of national specialty societies—Thomas McAllister, M.D., of the American Neuropsychiatric Association, and Steven Bartels, M.D., of the American Association of Geriatric Psychiatrists. And three assistant professors of psychiatry were elected to state leadership posts: Robert Santulli, M.D., as president of the New Hampshire Alzheimer's Association; Rebecca Neal, M.D., as president of the New Hampshire Psychiatric Society; and Alexander de Nesnera, M.D., as president-elect of the same group.

Harry Bird, M.D., professor of clinical anesthesiology emeritus and former New Hampshire secretary of health, was presented with the American Society of Anesthesiologists' Distinguished Service Award — the highest award the group can bestow on an individual.

John Baldwin, M.D., dean of DMS, was named chair of the Harvard Board of Overseers' committee on natural sciences.

Harold Sox, M.D., the Joseph M. Huber Professor and chair of medicine, was appointed to the National Research Council's research review committee, as well as to the Health Care Financing Administration's Medicare coverage advisory committee.

Michael Spinella, Ph.D., an assistant professor of pharmacology and toxicology, has received the National Institutes of Health's Howard Temin Award.

Jay Buckey, M.D., a research associate professor of medicine, is president of the American Society for Gravitational and Space Biology and a member of the National Academy of Sciences-National Research Council committee on space biology and medicine.



Two Dartmouth-Hitchcock Clinic physicians were recognized for service to the community and to medicine. John Elliott, M.D., of the Clinic's Lyndonville, Vt., branch, received the Vermont Medical Society's 1999 Community Service Award, and John Fothergill, M.D., of the Indian Stream Clinic in Colebrook, N.H., received the New Hampshire Hospital Association's Medical Staff Award.

Diane Kittredge, M.D., an associate professor of pediatrics, chairs the Ambulatory Pediatrics Association's Continuity Directors' Special Interest Group.

Julie Fago, M.D., an associate professor of medicine and of community and family medicine, was one of just seven physicians nationwide selected to receive a Geriatric Academic Career Award from the Public Health Service.



Robert Chamberlin, M.D., M.P.H., an adjunct professor of pediatrics, received the Excellence in Prevention Award from the New Hampshire Prevention Association, as well as the Franklin Rogers Award from the New Hampshire Pediatrics Society. Both recognized his work developing family resource centers.

Laurie Storey-Manseau, director of public affairs and marketing for DHMC, has been elected chair of the American Cancer Society's New England division.

Susan Camp, a supervisor of patient relations and information, was elected to a two-year term as president of the New England Society for Health Care Consumer Advocacy.

Achilles Papavasiliou, M.D., a resident in neurosurgery, received the New England Neurosurgical Society's Resident Award for a paper on using calcium channel blockers to treat subarachnoid hemorrhage.



John Mengshol, DMS '00, received the American College of Rheumatology's Medical Student Achievement Award for an abstract on collagenase.

Erratum: In the Fall 1999 issue, we mistakenly said that neurologist Colin Allen, M.D. (whose career was being recapped upon his attainment of emeritus status), had served as a consultant in urology back in the early '70s. He did not drop one specialty for another, but we had the . . . well, nerve to drop the "ne" from the latter reference to his field. ■