OFF ROAD

Living near a highway can be bad for your health in a million small ways

PLUS: PAIN AND TORMENT • CLEFT PALATE REPAIR • MY TIME AT PINE RIDGE
Molly Lederman, ‘12, had been running, kicking, rolling and tumbling for seven years as a soccer player and gymnast around Newton, Mass., when a friend suggested she have a go at pole vaulting. “Sure, I’ll try that,” Lederman replied. She was 12 years old then. Within three years, she had set the girls’ national indoor record in the event, a distinction she would claim four times before leaving high school.

Speed, strength and body awareness came together in vaulting, a mesh of talents that Lederman found irresistible. Her background in gymnastics was key. First came the full-tilt sprint down the runway and the planting of the tip in the ground. Then, at the top of the fully bending pole, she would find herself upside down in the instant when she prepared to fling herself over the all-too-easily toppled bar. This was a moment when body awareness was critical—no time to be wondering where your elbow or your kneecap were.

Lederman had the touch. As an undergraduate at Yale, she set just about every record possible, including both the indoor and outdoor women’s pole vault records. Sixteen times she was named All-Ivy and six times All-East in the event, and served as captain of the Yale women’s track-and-field squad, galvanizing others on the team. She also represented Yale at three NCAA regional meets and national championships. The time commitment required for training and competing while in college was extensive, about 25 hours per week.

Pole vaulting is tough to carry forward into adult life. “I would love to still do it, but it’s sort of a high-maintenance sport,” Lederman allows. She has found durable value in her years of training nonetheless, like chalk dust that stays on the hands. At track meets, she says, “everyone does one event, but any points go to the team total. In medicine, you work as a team, but each person’s individual responsibilities and contributions are vital to the overall collaborative effort.”

After she graduated in May, Lederman headed off to residency training in pediatrics at Massachusetts General Hospital.

—Bruce Morgan

**Up and Over**

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Cover photograph by John Soares
REMEMBERING JAKE’S
Over the years, Jacob Wirth’s restaurant on Stuart Street, with its oddly buckled sign across the front and its long mahogany bar inside, has drawn plenty of medical students, staff and faculty into its plain, high-ceilinged, mid-19th-century environs. The scent inside is indelible. Once inhaled, who can ever forget that sweet whiff of dust, varnish and old beer? For my money, Jake’s is as bare and charming a place as exists in Boston.

People from Tufts certainly like to go there. As the editor of this magazine, I’ve been struck by how often Jake’s gets mentioned—generally offhandedly, as a locale for fond memories—in the Class Notes section. Perhaps you have been there hoisting a pint among the regulars. If you send me your favorite memory of time spent at Jake’s, or any incident related to the place, I will collect these anecdotes and see what they add up to. Together, with any luck, we can create a fun feature devoted to Jake’s for an upcoming issue.

Your story can be any length, from a few lines on up. Please send whatever you have by email or regular mail, if you like, at the addresses below. Thanks, and I look forward to hearing what you have to say.

BRUCE MORGAN
EDITOR, TUFTS MEDICINE
136 HARRISON AVENUE
BOSTON, MA 02111
BRUCE.MORGAN@TUFTS.EDU

CLARIFICATION
As reported in the Winter 2012 issue of this magazine, Tufts School of Medicine plans to launch a physician assistant program. The first class of 30 students is expected to enroll in January 2013, pending provisional accreditation by the Accreditation Review Commission on Education for the Physician Assistant this September.

TALK TO US Tufts Medicine welcomes letters and suggestions from all its readers. Address your correspondence to Bruce Morgan, Editor, Tufts Medicine, Tufts University Office of Publications, 136 Harrison Ave., Boston, MA 02111. You can also email bruce.morgan@tufts.edu. Letters are edited for length and clarity.

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Cultivating Our Research Agenda

I’ve been thinking along these lines recently because of the charged historic moment we occupy in terms of biomedical research. Limited resources and a general climate of uncertainty with regard to government funding mean that our medical school is under increasing pressure to pick our research targets wisely. We must invest carefully and build on our proven strengths to be prepared for the world that awaits us 10 to 15 years down the line.

At our faculty retreat in mid-March, we discussed some dramatic implications of the challenges we face. I urged those present to set individual and departmental concerns aside and try to think about Tufts more broadly, as a place made up of a wealth of interacting parts.

Our organizational model may well need changing. A recent position paper from MIT on trends in research argues that “convergence,” by which the authors mean the knitting together of physical sciences, engineering and life sciences, is the most effective blueprint for addressing the health-care challenges of the 21st century. The authors describe convergence as the “third revolution” in biomedicine, following earlier landmark advances—notably, using molecular and cellular biology to understand disease, and the mapping of the human genome.

In a recent New Yorker article (“Groupthink,” January 30, 2012), Jonah Lehrer traces our national history of thinking about creativity. It used to be that genius came in the form of brilliant individuals such as Einstein or Darwin. But creativity has increasingly become a group process. As researchers have become more and more specialized, the need for collaboration has grown accordingly.

Physical proximity seems to play a big role in forging an effective approach. Lehrer’s article quotes a recent study that examined the relationship between the proximity of researchers to the quality of their research and found that when coauthors had offices that were physically close, their papers tended to be of significantly higher quality. “If you want people to work together effectively,” the study author concluded, “these findings reinforce the need to create architectures that support frequent, physical, spontaneous interactions.”

Speaking of accidents, Building 20 at MIT, cited by Lehrer in his article, was just that—in the best way imaginable. A rambling, three-story barracks-like structure erected hastily on campus during World War II, the site became famous for its poor ventilation, dim hallways and leaky roof. It was full of people who had been thrown together by chance. The internal layout was so confusing that even long-term residents were constantly getting lost as they wandered the corridors, having unexpected conversations and taking on fresh perspectives as they went.

The urban theorist Jane Jacobs had a great expression for these small, unsought conversations. She called them “knowledge spillovers.”

By the time of its demolition in 1998, Building 20 had become a legendary space for innovation, widely regarded as one of the world’s most creative spaces. Military radar, Chomskyan linguistics, an understanding of the physics behind microwaves and the first atomic clock all came from there.

The point for us is not to build decrepit spaces, or to create chaos, but to find new physical arrangements and to cultivate new ways of thinking for the job that lies ahead. You could say we want more knowledge spillovers occurring on our campus. In his article, Jonah Lehrer makes a compelling case for enacting such a change. “The most creative spaces are those which hurl us together,” he writes. “It is the human friction that makes the sparks.”

HARRIS A. BERMAN, M.D.
DEAN, TUFTS UNIVERSITY SCHOOL OF MEDICINE
Name That Hospital

Branding campaign ups the profile of Tufts Medical Center in a competitive market

Once upon a time, hospitals didn’t need to advertise. Life was simple: Your doctor referred you to a place, and you went there dutifully. But as medicine has grown more competitive and patients are more involved in their care, a lot has changed. Hospitals need to set themselves apart from the pack. That is why, starting in 2009, Tufts-New England Medical Center hired PARTNERS + simons, a Boston brand communications agency, to help position itself more favorably in the crowded Boston health-care market.

The first stage involved creating a new logo, a new look and a new name—shortened to Tufts Medical Center—and promoted online, on the radio (in one spot, a cabdriver with a Boston accent genially informs his passenger that Tufts-New England Medical Center no longer exists; it’s called Tufts Medical Center now) and on billboards around town. Fresh signage was also put up everywhere inside the hospital.

A year later, in 2010, the campaign expanded to include TV spots designed to drive viewers to online video clips that featured short, pithy cameos by some of the hospital’s more affable physicians. “We chose people who were telegenic and had a good story to tell,” says Tony Cotrupi, president of PARTNERS + simons. “Our research has shown that something happens when you meet a doctor for the first time—it’s either positive, or it’s not. The reaction is almost chemical.” In effect, the ad campaign tried to tip the scales in the hospital’s favor by putting a friendly human face on the institution.

Something worked. Over the past two years or so, the hospital website (tuftsmedicalcenter.tv) has drawn some 325,000 visitors who spend an average of two minutes each on the site, according to Cotrupi. “In our business, we call that ‘engagement,’” he says. Public awareness of Tufts Medical Center has also risen. Cotrupi’s agency conducts an annual quantitative survey of 600 health-care consumers to see how well its messages are being absorbed. In the most recent testing, when consumers were asked if they had seen any advertising for Boston-area hospitals in the past year, Tufts Medical Center was cited third most often among the dozens of possibilities.
On TV, if someone is found dead at a crime scene, the cause of death is often determined before the next commercial break. Computer displays shimmer, stylish lab techs with perfect hair glance through some gleaming device or other, and the verdict is offered at a snap. Real-life toxicology, however, is much slower and more deliberative.

“Some of the tests take days, weeks, months,” says Alan Hall, a board-certified toxicologist in Laramie, Wyo. A final toxicology report generally draws on multiple tests and precise confirmation of initial results.

The process is painstaking. Collection of blood, urine and tissue samples is a first step, says Barbarajean Magnani, pathologist-in-chief and chair of the Department of Pathology and Laboratory Medicine at Tufts Medical Center. Tissue samples are taken from the liver, brain, kidney and vitreous humor, the clear “jelly” found in the eyeball. Samples of the stomach contents and bile are also collected routinely.

Toxicologists, chemists and pathologists all play a role. “The first thing we would do is a basic screen for drugs in the urine and in the blood,” Magnani says, looking for such contributing factors to a patient’s death as opiates, amphetamines, marijuana, alcohol and barbiturates.

Confirmation of initial test results may require sending specimens around to more specialized laboratories. “Four to six weeks is pretty standard,” Magnani says of the average time to complete forensic toxicology testing. Backlogs at a laboratory anywhere in the testing chain may add to the delay.

Even after all this careful examination, the cause of death in a given case is not always evident. “At the end of the [TV crime] show, they don’t say it’s an indeterminate cause of death,” notes Howard Robin, a San Diego pathologist. But in real life, some 2 to 5 percent of such deaths are never figured out, he says.

Kernel of Truth

Popcorn, already known to be a good source of fiber, contains higher levels of beneficial antioxidants than some fruits and vegetables, according to a recent study. The big question is how much of those antioxidants does the body absorb?

Researchers at the University of Scranton in Pennsylvania analyzed four commercial brands of popcorn for antioxidants called polyphenols that are concentrated in the hulls. These compounds are found in a wide variety of plants. Generally speaking, antioxidants undo the damage that can be done by unstable molecules known as “free radicals.” The four brands tested had slightly different serving sizes, from a little under an ounce to just over an ounce. Antioxidants per serving ranged from 242 to 363 milligrams (mg). By comparison, a serving of fruits contains about 160 mg.

While the study is a good first step, it wasn’t designed to measure health benefits, notes Jeffrey B. Blumberg, a professor of nutrition at the Friedman School and director of the Antioxidants Laboratory at the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts, where he studies polyphenols and other substances in whole grains. “We already know whole grains are good for you,” he says. The next step is to figure out how much of popcorn’s good stuff gets out of the hulls and into your gut.

DEAD MAN TALKING

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Perfect Pitch

Like a lot of Tufts students, Evan Barnathan, a08, m14, pursues medicine because he wants to make a difference. But at the Josiah Quincy Upper School, a public high school minutes away from Tufts’ health sciences campus in Boston’s Chinatown neighborhood, he is using his talent for music, not medicine, to change lives. As a Schweitzer Fellow, a program that recruits graduate students in the health sciences to partner with their communities to fulfill unmet health needs, Barnathan launched an a cappella singing group, Atuned, at Josiah Quincy.

The move was a natural. A veteran of the Amalgamates, an undergraduate a cappella group at Tufts, and now a performer with the medical school’s Docappella, Barnathan believes singing together provides kids not only with an artistic outlet, but the opportunity to develop real-world skills such as leadership and the ability to compromise.

At the first audition last fall, Barnathan took all 11 students (plus one science teacher) who showed up. Musically speaking, they were a mixed ensemble. One student had six years of saxophone lessons under her belt; others weren’t even comfortable singing “Happy Birthday” in public, Barnathan says. So he started with basic scales and chords, eventually teaching the kids melodies and harmonies all by ear.

In addition to the two-hour group rehearsals he held every Wednesday afternoon from September to March, Barnathan also met individually with each singer every other week to work on a solo piece. All that effort paid off this spring, when the Atuned singers performed a set of five contemporary pop songs in front of friends and family at their school.

“It was beautifully done,” says Josiah Quincy Headmaster Bak Fun Wong, “Without [Barnathan], our lives will not be the same. Parents say to me, ‘I’ve never seen my daughter so excited.’ ”

—Jacqueline Mitchell

Level One Won

Early this spring, Massachusetts health officials designated Tufts Medical Center a “Level One” trauma center, an elite designation that could bring greater prestige and potentially more patients to the medical school’s primary affiliate.

The American College of Surgeons gave initial approval, which was then endorsed by the Department of Public Health. To become a Level One trauma center, a hospital must treat more than 1,200 trauma patients a year or about 250 severely injured patients, and also conduct top-flight research.

Reuven Rabinovici, chief of the division of trauma and acute care surgery at the hospital and a professor of surgery at Tufts, called the designation “an important landmark” for the medical center. “It reflects the expertise of our highly experienced medical staff and the comprehensive, state-of-the-art medical care we provide to our trauma patients,” he said. “Injuries are the leading cause of death for people ages 1 to 44, and receiving care at a Level One trauma center can decrease the likelihood of fatality from trauma by 25 percent.”
HERE, BUT NOT REALLY

When someone is absent from work, it’s obvious. His or her desk is unoccupied. What about when an employee shows up but is not fully functioning in the job because of depression, migraines, back pain or stress? This is a phenomenon that Debra Lerner, a senior scientist at the Tufts Medical Center Institute for Clinical Research and Health Policy Studies, calls “presenteeism.”

The causes may be multiple, but decreased worker productivity is the certain result. Presenteeism is less a character flaw in a worker than a temporary mental cloud that’s brought on by a particular challenge in an employee’s life, Lerner says. The institute looked at presenteeism across a number of industries and found it caused roughly a 3 percent loss in productivity. Among the chief contributing factors were emotional turmoil and tobacco and alcohol use among those surveyed.

Depression at work brings productivity losses “in the billions of dollars” each year, says Lerner. The good news is that the problem can be managed effectively. A test program Lerner developed, the Work Health Initiative (WHI), attempts to address worker depression through an online survey, followed by four months of phone counseling. The WHI offers “a calm way of informing people they may have depression,” Lerner explains. Initial results showed a 40 percent gain in time management skills among members of a test group.

The institute also offers a workbook component to help struggling employees gain control of their thoughts and feelings. In this approach, workers are led through exercises and given homework. In a recent trial with workers for the State of Maine, their ability to concentrate and perform on the job increased by nearly 32 percent using WHI methods, compared to a 4 percent improvement in a control group.

Moving with Parkinson’s

The ancient Chinese martial art of tai chi improved balance and lowered the risk of falls in a study of patients with Parkinson’s disease.

Symptoms of the brain disorder include tremors and stiff, jerky movements that can affect walking and other common motions. Medication and surgery can help, and doctors often recommend exercise or physical therapy as well. With its slow, graceful movements, tai chi has been shown to improve strength and stability in older people.

In the latest study, conducted at the Oregon Research Institute in Eugene, the benefits of tai chi were tested among 195 patients with mild to moderate Parkinson’s. Subjects attended twice-weekly classes devoted to tai chi or two other kinds of exercise—either stretching or resistance training, which included steps and lunges with ankle weights and a weighted vest. The tai chi routine was tailored for the Parkinson’s patients, with an emphasis on swing-and-sway motions and weight-shifting.

Chenchen Wang, who heads the Center for Complementary and Integrative Medicine at Tufts Medical Center and is studying the effects of tai chi on patients with arthritis and fibromyalgia, called the results “dramatic and impressive.” One of the study’s strengths, she said, is that researchers could measure results directly instead of relying on the patients’ reports.
When we hear the word “tuberculosis,” we’re likely to think of a plague from the Middle Ages or a poet dying of consumption in 19th-century Paris. Despite the perception that TB is a thing of the past, however, the contagious bacterial infection continues to have devastating consequences in much of the developing world. Tuberculosis now infects one-third of the world’s population, resulting in as many as 9 million new cases and 1.7 million deaths each year, according to the latest figures from the World Health Organization. Thankfully, 90 percent of people infected with the tuberculosis bacteria never contract the disease. Still, doctors and biomedical researchers are working to understand why some people develop TB while others do not.

“That’s the magic-bullet question,” says Gillian Beamer, an assistant professor of biomedical sciences at the Cummings School of Veterinary Medicine at Tufts. She is leading a research program to study the disease, focusing on two genetically different strains of mice—one that contracts TB when infected, the other that doesn’t. “I focus on how the [animals’] immune response fights the bacteria,” as well as the differences in TB-resistant and TB-susceptible mice, she says. “Someday, hopefully, the information can translate to humans.”

The bacterium that causes the disease, Mycobacterium tuberculosis, spreads through the air and can infect any organ in the body, though it is most commonly found in the lungs. Once inside the body, it burrows deep into cells, including the infection-fighting white blood cells. When TB infection occurs, nodules called tubercles form. Patients lose weight and energy and develop a persistent cough—eventually coughing up bright red blood before succumbing to the disease.

Tuberculosis has plagued humans since the Stone Age, and evidence of infection has been found in Egyptian mummies. In the Middle Ages it was known as the “white plague,” and in the 18th and 19th centuries it was the cause of a quarter of all deaths in the Western world. In the 1940s and ’50s, however, the availability of antibiotics and a new vaccine, effective in children, sharply curtailed TB outbreaks. “It was brought under control to a great extent and almost vanished from the population,” says Saul Tzipori, director of the infectious diseases program at the...
THOUGH HUMANS ARE MUCH MORE COMPLEX THAN THE MICE THAT BEAMER STUDIES IN HER LAB, IT MAKES SENSE FOR A VETERINARY SCHOOL TO BE CONDUCTING THIS RESEARCH.

Cummings School. Assuming that TB was history, doctors stopped administering vaccines and declared victory.

But when HIV/AIDS emerged in Africa in the 1980s, TB reemerged right alongside it, preying on the weakened immune systems of those infected with the human immunodeficiency virus. “HIV/AIDS created a whole new pool of susceptible individuals,” says Tzipori, holder of the Agnes Varis University Chair in Science and Society at Tufts. “The microorganism stays dormant in most people, but flares up mostly because of a change in the immune status of the host.” Even that connection is unclear, however, because the majority of TB patients don’t have HIV. “Quite often there is no clear indication” for who develops TB, says Tzipori.

When the New England Regional Biosafety Laboratory opened on the Cummings School campus in 2009, studying TB became a priority. Tufts recruited Beamer, who did her doctoral research on the disease at Ohio State University, where she looked at the amounts of certain cell-produced proteins that seem to control whether mice are more susceptible to TB. One of them, called interferon gamma (IFNg), appears to help the body fight TB by “turning on” white blood cells to make them more powerful combatants. Another protein, called IL-10, seems to have the opposite effect, shutting down the immune system instead of stimulating it.

The research may help identify who in a population is susceptible to TB and who isn’t. “A blood test could be developed to identify some kind of marker for protective immunity, and these are active areas of research by many investigators,” says Beamer. That could help physicians determine which patients would benefit from the antibiotics used to treat TB. The antibiotic course currently prescribed is extremely complex and expensive, consisting of multiple pills taken multiple times a day for six to nine months. Targeting their use to those most susceptible could help save resources, reduce side effects for patients and cut down on antibiotic-resistant strains of TB that recently have begun to emerge.

Though humans are much more complex than the mice Beamer studies in her lab, it makes sense for a veterinary school to be conducting this research. “To me, humans are just one other animal,” says Beamer, who earned her V.M.D. at the University of Pennsylvania. “The specific protein reactions that happen in a cell can be different, but in a broad way, what happens on an animal level is very similar.”

As a veterinarian with expertise in animal anatomy, physiology and cell biology, Beamer says she has “been trained to evaluate the entire animal, so I have a slightly different perspective than people who don’t have that training.”

Beamer wants to expand her research to look more closely at what happens to individuals when they progress from a controlled infection to an active stage of TB. Her efforts could help in the global fight against the disease that includes attempts to develop a more effective vaccine, new antibiotics to target specific strains of TB and less-invasive diagnostic tests (for example, using spit instead of drawing blood).

“Despite the many labs around the globe that are working on TB, there is still some basic information that is missing,” says Tzipori. “If we can generate a better understanding about what happens between the host and the bug, then we can devise better measures for control.”

While those measures may be a ways off, the Tufts researchers are contributing to a multipronged attack designed to make TB history once again.

Michael Blanding is a freelance writer based in Boston.
EVIDENCE IN THE MOUTH

Dental researchers at Tufts explore the relationship between Type 2 diabetes and gum disease by Helene Ragovin

THE PATIENT, A MARINE
Corps pilot, arrived in great spirits for his exam. But after chatting a bit with the dentist, Terrence Griffin, the officer mentioned he’d been feeling a little tired.

Then Griffin looked in his mouth. “He had advanced periodontal disease,” recalls Griffin, D71, DG75. Like all military pilots, the patient had undergone a complete exam just six months before, and his oral health had been top-notch. And then the pilot confessed something else: He could no longer see the numbers marking the airplane navigation lanes on the runway.

A blood test confirmed what Griffin had suspected: The pilot had diabetes. And while he had ignored other symptoms—the tiredness, the blurred vision—he couldn't hide the evidence in his mouth.

The correlation between periodontal disease and diabetes has been well-documented, most recently in the cover story of the January 2012 issue of the Journal of the American Dental Association. About 25.8 million Americans have diabetes—and about 7 million of those don’t even know it, according to the CDC.

Spurred research to understand the biochemical mechanisms that drive the relationship and also to explore treatments. Jake Jinkun Chen, D109, professor and director of the Division of Oral Biology at Tufts School of Dental Medicine, is investigating the role of adiponectin, a hormone derived from fat tissue, in periodontitis associated with Type 2 diabetes. His work is supported by a $1 million-plus grant from the National Institutes of Health.

Type 2 diabetes, also known as non-insulin-dependent diabetes, is a form of the disease in which the body cannot produce enough insulin, the hormone necessary for glucose metabolism, or the body’s cells cannot properly use it. (In Type 1 diabetes, the pancreas does not produce any insulin.) Once known as adult-onset diabetes as in nondiabetics, says Chen. And in those with Type 2 diabetes, “periodontal disease is more severe and resistant to treatment,” he says, because diabetes “triggers the release of excess inflammatory factors, which in turn stimulate osteoclasts,” or cells that erode bone.

The hormone adiponectin was identified in the mid-1990s and appears to play a role in Type 2 diabetes, obesity and cardiovascular disease. Higher levels of adiponectin appear to lower risk for Type 2 diabetes, because it makes cells more sensitive to insulin, Chen says, noting that adiponectin has been used to treat diabetes in mice. The hormone also has antiinflammatory properties, which are important for tamping down the inflammation associated with periodontitis. “It’s a very useful molecule,” he says.

Preliminary studies by Chen and others have established a strong correlation between low levels of adiponectin and the development of periodontitis. Chen's lab was the first to report evidence that adiponectin promotes bone formation by inhibiting osteoclast formation and bone loss.

“Adiponectin is one stone that can kill four birds,” Chen says. That is, it increases insulin sensitivity, acts as an anti-inflammatory agent, promotes bone formation and inhibits bone loss.

Using an animal model, Chen and his colleagues are investigating the role of adiponectin in periodontitis and its potential as a therapeutic target for diabetes.

ABOUT 25.8 MILLION AMERICANS HAVE DIABETES—AND ABOUT 7 MILLION OF THOSE DON'T EVEN KNOW IT, ACCORDING TO THE CDC.
A new Tufts study finds that obese children get their permanent teeth earlier than kids who are not overweight—research that has important implications for the initiation and frequency of pediatric dental care.

The early eruption of permanent teeth increases the risk for cavities, malocclusion and crowding, as well as temporomandibular joint (TMJ) disorder, says Aviva Must, the Morton A. Madoff Professor and chair of public health and community medicine at Tufts School of Medicine, who was the principal investigator on the study.

The research, published in February in the journal *Obesity*, "indicates the need for comprehensive and frequent oral evaluations in obese children to avoid the health pitfalls that accompany early eruption of permanent teeth," says Must, N87, N92, who coauthored the study with colleagues at Tufts, the Frances Stern Nutrition Center at Tufts Medical Center and HarvestPlus International Food Policy Research Institute.

The study compared the timing of tooth eruption in obese and nonobese children. The researchers analyzed data on 5,838 children, ages 5 to 14, collected as part of the National Health and Nutrition Examination Survey (NHANES) between 2001 and 2006. The NHANES survey, conducted by the Centers for Disease Control, assesses the health and nutritional status of Americans.

They found that obese children, on average, had 1.44 more permanent teeth at any age than nonobese children. Age does figure in, Must says, with the greatest number of permanent teeth seen at age 10, when the obese children had an average of three more teeth than their nonobese peers.

"All children are more susceptible to cavities when their first permanent teeth come in, because these are not fully mineralized," says Stanley Alexander, D75A, professor and chair of pediatric dentistry at Tufts School of Dental Medicine.

Weight is not the only factor that can affect children’s tooth eruption, Alexander says. Sociological, lifestyle and genetic factors also play a role.

"In the future, we envision adiponectin as a therapeutic agent for regeneration of damaged tissues in patients with diabetes-associated periodontitis," he says.

He calls periodontitis “one of the most pressing issues in dentistry”—and in public health. “Almost everybody over age 40 has some kind of periodontal problem,” Chen says, which can lead to the bone loss, and eventually tooth loss.

Few cases are quite as stark as the Marine pilot who developed severe diabetes in a matter of months. Clinicians need to be vigilant in identifying patients who have inflammatory periodontal disease and do not respond well to an initial line of treatment that includes cleaning, scaling and root planing, Griffin says. “That would tell us, perhaps, that we should investigate if the patient has a systemic component, and one of the first things we look at is diabetes,” he says.

Conversely, physicians need to be aware of periodontal disease as a barometer of a patient’s overall health, Griffin says. “I think it’s wise for physicians to ask about dental conditions. It works both ways.”

Helene Ragovin is the editor of Tufts Dental Medicine magazine, where this article first appeared.
DROPPED

BY MICHAEL KEMMER, A99, M.D./M.A. (FLETCHER) '14
As a substitute teacher on the Pine Ridge Reservation, the author found sparks of talent, resilience and curiosity—plus rampant absenteeism—among his students.

HAVE A GOOD VIEW FROM WHERE I’M SITTING. About halfway up the gymnasium bleachers. Pine Ridge High is behind, but they’re coming back. You can see the confidence building in the team, in how they pump their fists, nod in agreement at the coaches’ instructions from the sidelines and plant their feet like boxers anticipating their opponents’ next move. Kianna Walking Eagle starts the point with a nice serve, followed by a strong return by Gregory High. A dig, a setup and then a well-executed spike—point for Pine Ridge!

The stands wobble and shake, the result of an overtly vocal and raucous group of high school students sitting below me. Like those students, I had traveled more than 200 miles tonight—along lonely, open, two-lane roads that snaked through endless honey-colored hills—to watch this women’s high school volleyball game. For a few simple, happy moments, texting and Facebook posting ceases, as Pauli Siers, Santana White Dress, class president Mike Hawk and several dozen other Pine Ridge High students show their support.

It’s funny. I’ve been teaching these kids for three weeks, and I’ve never seen them pay this close attention to anything I’ve written on the board. But that’s OK; I’m paying attention to them. I like what I see, and this time I’m cheering along. It may have been a long way to travel, but Pine Ridge had some terrific athletes. Kianna was a two-time South Dakota High School athlete of the week, while fellow sophomore Santana would later, under the watchful eye of college recruiters, lead the basketball team to the state finals.

Sitting in a high school gym in the middle of South Dakota, surrounded by young people with last names like Kills Enemy at Night, didn’t exactly fit in with what I was used to: the standard format of patient history, physical, assessment and treatment plan. As a third-year medical student at Tufts, nearly all my time is spent in the clinical environment. For one month last fall, though, my official role was 10th-grade biology teacher at Pine Ridge High. This meant seven periods a day, for roughly 100 students total. Of course, I had a lot to learn in this new role, though I tried not to show it.

BRIGHT AND CLEAN
I didn’t just arrive with a book and a backpack. To make this little experience happen, there was an application, an interview, a logistical process, and of course, a bit of enterprise.

In 1995, while a student at Harvard Medical School, Miles Cunningham, now a neurologist at McLean Hospital, was able to convince a reservation high school in South Dakota to allow him to come teach for a month. Soon after, he started “Asniya,” which means “to heal” in the language of the Dakota Sioux. Since then, more than 50 health-profession students have served as Asniya “interns.”

Pine Ridge Indian Reservation, in southern South Dakota, is home to roughly 30,000 Oglala Sioux. It is one of the largest reservations in the country. According to some measures of wealth, it is also the poorest, with an unemployment rate around 80 percent. Type “Pine Ridge Reservation” into Google, and “poverty” is the next word that comes up. Encumbered by alcoholism, depression and a rate of diabetes...
five times the national average, the life expectancy is 48 for men and 52 for women. Outside of Haiti, that’s the shortest life expectancy for any community in the Western Hemisphere.

What would I find there? As I made the six-hour drive from Denver through Wyoming, Nebraska and ultimately to Pine Ridge, the confluent effect of statistics and perception evoked a degree of anxiety in anticipation of the challenges and accomplishments I could expect in the next month. It wasn’t as though I felt completely unprepared. I had been out of college several years before starting medical school, with jobs like bookseller and bicycle messenger ranking among the eclectic work experiences I had accumulated during that time.

High school teacher, however, was not one of them. High school students can be difficult in any time or place—were these kids going to walk all over me? Drug use, safe sex, even health careers were all subjects I was likely to spend some time on, but how could I present any of this in a way to maintain their interest and motivation? What were they going to expect from me, if anything?

Mrs. Williams, the warm, grey-haired teacher whose class I would be taking over, made me feel welcome with her agreeable demeanor and good sense of humor. She was beloved and respected (usually) by the students, drove 90 minutes each way between work and home, and was in her 42nd year of teaching at Pine Ridge.

The space itself was surprisingly modern. I found a classroom well equipped with an interactive white board that would make lessons fun and lively. The hallway floors were designed in school colors, lined end to end with spacious lockers and sports trophy cabinets long since undersized to hold their contents. Built in the last 15 years, the school had a large cafeteria that filled to capacity during the single lunch hour. A new dorm had been built across the way that housed dozens of students. The entire facility seemed well planned and well maintained.

**WHAT LAY BENEATH**

On my first day, short video clips of bronoscopies and colonoscopies drew the intended reaction, and multiple-choice trivia questions (e.g., If you eat a burrito for lunch, what time do you poop it out?) seemed well planned and well maintained.

Unfortunately, however, absenteeism was rampant, and dropping out was commonplace. On my first day, I noticed a student reading a collection of Edgar Allan Poe stories. The next day I had planned on asking him about his favorite. I never saw him again. He could have left for any reason, but the number of students who stopped showing up, or were out for weeks at a time, was something I had not seen before.

On our last day, after completing their group review test with flying colors, one of the students said to me, “I can see I learned a lot, but I didn’t realize it as it was happening.” It was probably the best thing I could have heard a student say, and one I couldn’t help but smile about and relate to as his teacher and a student myself.

The following afternoon found me buckled into seat 21A, with my bag in the overhead compartment and the information for my upcoming internal medicine rotation lying on my lap. I tried to read it, but my mind kept wandering, from volleyball games and open roads to what Poe called in one of his poems “the fervent flickering torch” of youth.

**THE NUMBER OF STUDENTS WHO STOPPED SHOWING UP, OR WERE OUT FOR WEEKS AT A TIME, WAS SOMETHING I HAD NOT SEEN BEFORE.**

Kemmer hopes to get back to Pine Ridge someday soon.
The island of Martha’s Vineyard sits seven miles off Cape Cod, a 45-minute ferry ride to the mainland and then a 65-mile drive to Boston—but it might as well be an ocean away if something is terribly wrong with your child.

Carol Vieira was four months pregnant with her third baby when a routine ultrasound revealed something wasn’t quite right. Her doctors at the island hospital suspected cleft palate.

A lifelong islander, Carol, an occupational therapist, and her husband, Garrison, a corporal on the West Tisbury police force, took the news about as well as any expectant parents could. “No one ever wants to hear that their child will have to suffer in any way, and that was very true for us,” says Carol. But cleft palate often means there are other health problems, some of which can’t be ruled out until after a baby is born. “Those question marks caused more stress for us,” she says.
The couple ended up in Boston, at the Cleft Lip and Palate Clinic at the Floating Hospital for Children at Tufts Medical Center, where the diagnosis was confirmed. There, the Vieiras met two Tufts pediatric dentists, who offered a way to ease their anxiety about their unborn baby, a girl. The couple learned about a relatively new orthodontic therapy that would make the eventual surgery to repair their baby’s cleft palate less complicated.

If the Vieiras agreed, their baby, due in February 2011, would be the first to undergo the procedure, called nasal alveolar molding, or NAM, at Tufts Medical Center, the only Massachusetts hospital that offers the treatment. Their daughter’s split palate would be gently moved together, millimeter by millimeter, over the first few months of her life.

The dentists, Serena Kassam, A02, D05, and Jessica Chiang, DG09, surely would have understood if the Vieiras decided they didn’t want their baby involved in something so new, never mind the fact that she would be the first. But in Carol and Garrison Vieira, who had taken in a foster infant just seven weeks before their older daughter, Alyssa, now 2, was born, the Tufts dentists found parents who were resolute in confronting the challenge dealt them. They chose to go forward.

“They presented NAM with such clear and confident authority [that] we never questioned that plan of action. We felt like pioneers,” says Carol, whose diminutive features belie a well of inner strength. “Knowing what to expect in terms of her diagnosis, as well as the exact care and treatment that she would be receiving—and that there was already a dedicated team preparing for her arrival—was very reassuring.”

EARLY INTERVENTION
Craniofacial malformations such as cleft lip and palate are the most common birth defects in the United States, occurring in one of every 1,000 newborns, according to the National Institutes of Health. Although the cause remains unknown, scientists believe an olio of genetics and environmental factors may be at work. The defect occurs when the nose and upper jaw fail to fuse properly, somewhere between the third and sixth weeks of fetal development. Cleft lip and palate can occur independently or together, and malformations can range from a tiny hole in the roof of the mouth to a more dramatic misalignment of the facial features. A unilateral cleft creates a gaping hole in a baby’s face, and the nose may be pushed off center. In a bilateral cleft, the premaxilla, the bony ridge that contains the tooth buds for the upper front teeth, may overly protrude from the mouth, and the nose appears widened and flattened.

Nasal alveolar molding was developed in the 1990s at New York University’s Langone Medical Center by an orthodontist and a plastic surgeon. NAM is becoming the preferred initial treatment for cleft lip and palate because it doesn’t require general anesthesia—which should be avoided for babies under 3 months old—and therapy can start a few weeks after birth, when the craniofacial features are quite pliable and growing rapidly.

That early start is one reason NAM is catching on, says Andrew Scott, a pediatric facial plastic surgeon and codirector of the Tufts Cleft Lip and Palate Clinic. “There’s a rising community of those who do NAM,” says Scott. “Those of us who have seen it in action are all believers.”

NAM therapy uses a custom-made acrylic orthodontic plate—much like the retainer many of us wore when our braces came off—to move the two sides of the palate closer together. Surgical tape anchored to the mouth plate and secured across the baby’s cheeks exerts enough tension to gradually move the upper jaw and gum ridges into better alignment. Several weeks into the therapy, when the baby’s face is a bit more symmetrical, the dentists begin using nasal stents—acrylic balls attached to wires embedded in the mouth plate—to give more shape and structure to the baby’s nose. The stents nudge the nasal cartilage forward to create a more natural profile. In traditional cleft palate therapy, the nose remains untouched until the first surgery.

Dentists and plastic surgeons work as a team, adjusting the mouth plate weekly to take advantage of a newborn’s rapid growth spurts. The goal is to move the gum ridges, upper jaws and nose, not to their final destination, but into the best possible position for a plastic surgeon to close the cleft lip when the baby is three to five months old. A second surgery to repair the palate generally happens around the child’s first birthday.

Kassam, an assistant clinical professor, and Chiang, an assistant professor, both in the pediatric dentistry department at Tufts School of Dental Medicine, are something of pioneers themselves. With Mohammad Mansoor Ahmed, DG09, the trio helped establish the only two NAM clinics in New England, one at Tufts and one in Rhode Island.

While teaching parttime at Tufts Dental School, Ahmed completed a fellowship in craniofacial pediatric dentistry at Langone Medical Center, where he learned to do nasal alveolar molding from Barry Grayson, one of the coinventors. Kassam and Chiang also learned the technique there.

Ahmed and Kassam established a NAM program at St. Joseph Hospital in Providence, R.I., where Kassam did her residency in pediatric dentistry. When she returned to Tufts, Kassam recruited Chiang to help establish the first NAM clinic in Massachusetts. “These young faculty really provided the impetus and drive to bring NAM to Tufts,” says Stanley Alexander, D75A, professor and chair of pediatric dentistry.

The demand for nasal alveolar molding continues to grow, Kassam says, but there are not enough dentists and surgeons trained in the technique to meet the need. While the NAM itself is not difficult to learn—it’s similar to making dentures, Chiang says—it is time-intensive, for the families and for the many specialists who care for the infant during the first year. The Tufts team was trying to identify the ideal first patient in Massachusetts when they met the Vieiras.

FEELING IN CONTROL
NAM combines the best of traditional cleft-repair therapies and eliminates some of their greatest drawbacks. The most common is a mechanical appliance called the Latham device, which is surgically implanted in a baby’s palate three months after birth. Once the baby heals, doctors reposition the gum ridges and jaws by turning a screw in the implanted metal device. The technique is often effective, but causes some babies significant discomfort, and some have trouble feeding.

An older treatment, still used for less-severe cases, is lip adhesion, in which a surgeon stitches the edges of the cleft lip together. While this creates enough tension to move the jaw and gum ridges into better alignment before the baby undergoes another surgery to correct the cleft palate, it is still surgery
requiring anesthesia, and creates scarring before the final lip repair.

While the larger aim of NAM is to close the cleft as much as possible before palate-repair surgery, there are several short-term gains. The orthodontic mouth plate plugs the hole in the cleft, keeping milk or formula out of the baby’s nose and allowing the infant to create enough suction to drink, gain weight and thrive. Scott, the pediatric surgeon, recalls one case in which a baby’s bony gum ridges were rotated up into his nasal cavity, blocking his airway on one side. The pediatric dentists used the NAM mouth plate to push the bony ridge out of the way. “That’s incredibly important because children must breathe through their nose or they can’t eat or drink. So it had immediate functional implications,” says Scott, an assistant professor of head and neck surgery at Tufts School of Medicine.

Perhaps just as important as the therapy is the emotional benefit to parents of not having to wait to start treatment until their baby is old enough for surgery. Parents of these infants sometimes feel helpless or even guilty, Scott says, unable to do anything to help their fragile newborn. The three- to five-month wait before their baby can undergo corrective surgery can be unbearably painful. “NAM offers them something to do that feels proactive,” he says. “That can be very helpful for these parents psychologically.”

That was certainly true for Carol and Garrison Vieira. “NAM gave us the opportunity to feel like we had a little control in a situation where you really don’t feel like you have any control at all,” says Carol. When their daughter was born on February 3, 2011, the couple named her Nayelli, a Native-American word that means I love you. “We knew she would need a little extra love,” Carol says.

Because cleft lip and palate can interfere with such basic things as eating and learning how to talk, from day one Nayelli had a team of specialists devoted to her well-being: otolaryngologists, geneticists, audiologists, speech and occupational therapists, psychologists, plastic surgeons, pediatric dentists and prosthodontists. “There are so many different aspects of care for these children. There’s just no way to do this without having a team,” says Arnold Lee, an assistant professor of head and neck surgery at Tufts Medical School and the other codirector of the Cleft Lip and Palate Clinic.

The most crucial members of the team, though, are not dentists or surgeons. Unlike other treatments for cleft palate, NAM depends heavily on the parents’ involvement—and that’s on top of the weekly clinic visits. The Vieiras had to remove Nayelli’s mouth plate once a day to clean it and the inside of her mouth. They had to reattach the surgical tapes properly, making sure there was enough tension to move her features without pulling too hard on the skin.

“NAM [therapy] gave us the opportunity to feel like we had a little control in a situation where you really don’t feel like you have any control at all.”

—Nayelli’s Mom, Carol Vieira
“The good part of NAM, as well as the bad part, is that it requires so much family participation,” says Scott.

“The worst part of it was that she hated it,” Carol Vieira says of the daily ritual. “But it’s not a big thing at all. It really isn’t. You bathe them once a day, you wash their face, you just add this to the routine.”

Not everyone is as determined as Nayelli’s mom. “We do have parents who will give up if we don’t prepare them well enough,” says Chiang, the pediatric dentist.

Since Nayelli inaugurated the Tufts program, four more babies are receiving NAM therapy. A sixth family, overwhelmed by the daily care required for a successful outcome, gave up. That’s why the cleft team begins preparing parents early, ideally during prenatal visits, as they did with the Vieiras. Chiang uses a baby doll with a realistic-looking cleft lip and palate and its own NAM mouth plate to teach parents how to care for their baby. That put Carol and Garrison at ease. “We knew what we were coming home with,” says Carol.

“One family determines they want to work with you, we have to become like a member of their family,” says Chiang.

“It’s not a staff, it is a family. That sounds cliché, but it’s true;” says Garrison, recalling the times the surgeons rearranged their schedules to see Nayelli when the Vieiras happened to be on the mainland. The dentists frequently adjusted the course of treatment in response to Carol and Garrison’s observations or concerns. When Nayelli’s cheeks got too irritated from the pressure of the surgical tape, the dentists adjusted the angle so the tape tugged less. That slowed down progress a bit, but Nayelli felt better. “They really did listen to us and respond,” says Carol.

**A GOOD WEEK**

When Francis Pereyra and Perla Zapata arrive at the Tufts clinic with 6-week-old Jayden, it does feel a bit like a family reunion. Jayden’s parents are all smiles. After just one week wearing the NAM device, their son’s cleft is dramatically smaller.

“Mommy’s happy because she can see the results,” Chiang says as she eases Jayden onto a child-sized dental chair in the corner of the tiny exam room. The boy fusses half-heartedly as Chiang peels the tape off his face and removes the mouth plate. His mother, seated in the corner, clucks at him softly, and the tiny patient drifts off to sleep, even as Chiang and two students who have come to observe, Eunice Lee, D12, and Elizabeth Ackerman, a postgrad in pediatric dentistry, buzz about the baby. When Chiang measures the gap, it has closed by nearly an eighth of an inch. “You are doing a really good job,” she tells the parents more than once.

Chiang exudes confidence and optimism. As she works, she maintains a constant upbeat banter with Jayden’s parents, describing what she’s doing and cluing them in on what to expect as the therapy progresses. She reaches into her toolkit, brimming with dental impressions, wires, surgical tape and sundry instruments, for a flashlight. As she peers into the baby’s mouth, checking for any irritation the mouth plate might be causing, Chiang peppers Jayden’s parents with questions about their week. How did the baby eat? Sleep? Tolerate the mouth plate? The boy ate well, his delighted parents report, and that helped him sleep better. Chiang picks Jayden up. “He got a lot heavier,” she says with a wide grin as she slides the baby back into his mother’s arms.

Cradling the boy’s plastic mouth piece in her left hand, Chiang uses a dental drill to sculpt it so it will close Jayden’s cleft palate more in the week ahead. She deepens the troughs where his gum ridges sit to nudge those tissues to grow in that direction. She adds putty where she wants to create pressure to push bony tissue into the trough. To the casual observer, the work seems more art than science. “It can appear to be very mysterious to those of us who don’t know what we’re doing,” says Scott, the surgeon. “Jessica [Chiang] is very adept at it.”

Chiang and Scott confer, their heads bowed over the tiny mouthpiece, as they pool their expertise to assure the best possible positioning of Jayden’s gum ridges and upper jaw before he undergoes corrective surgery in a few more months. “Being able to do that together every week is an added bonus that’s unique to our program,” says Scott.

Chiang gently slips the device back into Jayden’s mouth and replaces the surgical tape. The baby’s cheeks, slightly red from the tape, are full and round, and his chubby feet and hands peek out from his tiny corduroys and button-down shirt. Though he’s clearly a good eater, Scott asks his mother to give her son a bottle to make sure the newly adjusted mouth plate won’t interfere with his eating in the week ahead. When Jayden begins to drain his bottle, the family is ready to make the hourlong drive back home to Lawrence,
Mass. They’ll be back next week for another adjustment and progress check. Not every week is so easy, Chiang reminds the couple. “It can be discouraging at times,” she adds. Sometimes the gap doesn’t close much. Other weeks a baby won’t or can’t tolerate the device very well. But visits like the one today with Jayden negate any setbacks. “When I see a really big change like this, that’s how I keep going,” Chiang says.

Right now, Chiang is something of a one-woman dental team at the Tufts Cleft Lip and Palate Clinic. Kassam has been on a fellowship in Guayaquil, Ecuador, training a prosthodontist and an orthodontist to do NAM therapy. In Ecuador, cleft palate is more prevalent, about one in every 350 births. This spring, Kassam and her trainees are using NAM to treat 20 babies. Ahmed, who grew up in Dubai, is setting up a NAM clinic at Dubai Health Authority Hospital, where he is a senior specialist in the pediatric dentistry department.

CELEBRATIONS ALL AROUND

At birth, the cleft in Nayelli Vieira’s palate measured 16 millimeters wide, more than half an inch across. “She could fit her whole tongue in there,” says Scott, the pediatric surgeon. After she wore the NAM appliance for five months, Nayelli’s cleft was just four millimeters wide, less than the diameter of a pencil-top eraser. Narrowing the divide that much “makes a huge difference in reconstruction down the road,” says Scott, who repaired Nayelli’s lip when she was 5 months old. “[Drs. Kassam and Chiang] were able to stretch her lip a little bit and mold her nose so that the surgery that I did was technically easier and had, I think, a better outcome than it would have without the NAM,” he adds.

Nayelli had her palate repair surgery on January 31, and celebrated her first birthday in the hospital four days later. A tiny rock star, she had well-wishers from her cleft team visiting all day. Hospital staff decorated her room and brought presents, balloons and cake.

A month later, the little girl with big blue eyes like her mom’s is as beguiling and flirtatious as any 1-year-old. On this bright Sunday in March, the Vieira family—Carol, Garrison and Nayelli, plus big brother Micah, 9, and sister Alyssa, 2, and the family dog, Tao—walk the beach near their island home. The wind is nippy, but the warmth of the sun hints at the season to come. Clad in fleece, Nayelli takes a bottle from her mom as the two perch atop an overturned rowboat. The sisters take turns riding on their parents’ shoulders, while Micah, dreaming of his upcoming baseball season, snaps a ball into his glove. “We have a really happy family,” he says, mostly to himself.

Side by side in a double stroller, the Vieira sisters look, well, like sisters. Only the faint scars on Nayelli’s upper lip indicate what she has been through to get to this glorious spring day. Her nose is not quite symmetrical and will require more surgery once she finishes growing, likely well into her teens. “These kids typically require procedures even when they are not kids anymore,” says Arnold Lee, the surgeon. “It’s a lifelong process, really. We do expect to be working with patients and their families for a long time.”

In many of these kids, the growth of the upper jaw lags behind that of the rest of the face, resulting in a pronounced underbite that the surgeons will have to correct. Most children born with cleft palate eventually need braces. No one can predict what Nayelli may need down the road. “It’s a moving target,” says Scott, the other surgeon. “We care very much about how these children look, but in the end, we care most about how they function.”

Nayelli’s baby teeth are just beginning to come in, and the Tufts dentists are monitoring that milestone closely. In children with cleft palate, the teeth can be too small, or conical, or just the wrong shape. That doesn’t matter so much with baby teeth, though, so for now, the goal is to prevent decay. “She’s already had a lot of surgery,” says Chiang. “We want to take care of those teeth so she doesn’t get cavities and wind up in the operatory.”

It’s been more than six months since Nayelli completed her NAM treatment, and the little girl no longer recognizes Chiang. It is bitter-sweet for the pediatric dentist, who admits she has grown attached to her first NAM patient. After Nayelli’s palate repair surgery, Chiang was among the birthday visitors in her hospital room. She cried when she saw how much Nayelli had grown, how different she looked after her operation. Though they don’t see each other regularly anymore, Chiang says she can’t forget the little girl and her own role “in the early stages of her lifetime.”

“…”When I see a really big change like this, that’s how I keep going.”

—Pediatric Dentist Jessica Chiang
Amid widespread medical confusion surrounding chronic pain, Pam Ressler is using the web to relieve the isolation of its sufferers.

**BY BRUCE MORGAN  ILLUSTRATION BY SCOTT BAKAL**

PAMELA RESSLER WAS A NURSE AT BOSTON-AREA HOSPITALS FOR about 20 years before she encountered pain in a serious way. As she says, “Pain was a background issue or a side issue in my R.N. years. Pain was just a symptom to be treated.” That was before her life, and her understanding of pain, took a dramatic turn.

Ressler’s son, Nick, who was diagnosed with ulcerative colitis at age 3, entered a hospital for emergency treatment for pancreatitis during his middle-school years. He was in terrible pain, typical for the condition, she says. Before long, Nick developed bile duct cancer, and he was transferred to Massachusetts General Hospital—by many measures, one of the nation’s finest. Nick’s pain never relented, despite anything and everything that modern medicine could bring to bear. The failure left Ressler baffled and dismayed. “I couldn’t believe it,” she recalls. “Here we have the best care in the world, and he’s still in tremendous pain.”

A feeling of acute isolation was one consequence of the sensory damage. As author Melanie Thernstrom points out in her revelatory best-selling 2010 book *The Pain Chronicles*, which describes her decade-long hunt among specialists for relief from a shoulder injury, “To be in physical pain is to find yourself in a different realm—a state of being unlike any other, a magic mountain as far removed from the familiar world as a dreamscape. Usually, pain subsides; one wakes from it as quickly as possible. But what of pain that persists? The longer it endures, the more excruciating the exile becomes.”

There was a lot of pain and a lot of crying in Nick’s hospital room. When Nick told his mom and dad that he just wanted to be a kid again, they realized some of what he had lost to his illness. They promptly brought him his two favorite guitars from home, as well as a laptop. Nick played his guitar for the residents, and eagerly logged onto the web to chat with friends back home. “He’d be on with his friends, and there wouldn’t be any pain,” says Ressler. “He could be Nick again.”

Her son died in April 2001 at age 14. That experience in the hospital transformed Ressler. She continued working as a nurse for several more years before deciding, at age 48, to enter the Pain Research, Education and Policy Program (PREP) at Tufts—a one-of-a-kind multidisciplinary master’s degree designed for health professionals. Ressler was determined to learn more about two concerns that nagged at her in the weeks and months following her son’s death.

Why had doctors been unable to treat her son’s pain adequately in his final days? And how might the simple things that she had seen restore her son’s quality of life—such as having the lifeline of a computer near at hand—be applied to a wider community?

BACK TO THE SOURCE
The history of pain must be seen through a cultural filter. It’s a complicated picture, to say the least, more like a braided rope than a clothesline. At every point since Creation, a physician’s way of thinking about pain, and by extension the average patient’s experience of pain, has been orchestrated by the belief system that frames its occurrence. By many religious accounts, pain began in the Garden of Eden. Adam bit the forbidden apple, and the headaches for everyone began right there. As we all know, women were condemned by God to suffer in childbirth as one consequence of the Fall, but that was just the start. “Thorns also and thistles shall [the ground] bring...
forth to thee,” God tells Adam after his grave transgression. Those were the truly dark days of pain, once the fig leaves came off.

Over time, as civilization has developed far enough to include iPods and cappuccinos among its amenities, the meaning—which is to say the human interpretation—of pain has changed dramatically. But in the ancient world, pain was always something more than mere bodily injury. It was seen as a signifier, a judgment delivered from above that reflected fair punishment for the soul’s demerits.

Pain and the spirit were always closely linked, and sometimes for good, according to the prevailing view. Pilgrims and ascetics struggled to get nearer to God by enduring painful rites of all kinds. Martyrs sought out painful deaths—the more painful, the better. A deep belief in the spiritual properties of pain led to its regular use in jurisprudence in the pre-modern world, not only for punishment but also for determining the guilt or innocence of a suspect. This system was known as “trial by ordeal.” Suspects would be forced to walk on burning coals or to plunge their hands into a pot of boiling water. If God failed to protect them from pain, they were guilty.

The arrival of anesthesia in the mid-19th century threw a wrench into the conventional understanding of pain by removing its necessity. Many Christian churches objected to the use of the new anesthetic on the grounds that it contradicted God’s commandment to Eve concerning the pain of childbirth. Doctors lent their voices to the resistance, arguing that pain was conducive to healing. “Pain during operations is, in the majority of cases, even desirable; its prevention or annihilation is, for the most part, hazardous to the patient,” wrote a British physician. Eliminating pain was seen as tinkering with the natural order.

Nevertheless, by the end of the Victorian era the game had changed irreversibly. Pain no longer held any meaning in medical practice—or if it did, that meaning was greatly subdued. Instead, doctors in the early 20th century overwhelmingly began to view pain in simple physiological terms, as a biological symptom of disease that could be, and should be, mediated through timely intervention.

That brings us to the current day. As Ressler’s experience with her chronically ill son in the hospital suggests, and The Pain Chronicles confirms, the treatment of pain in the United States—particularly chronic pain lasting several months or more—is largely ineffective because it is so little understood. The confusion makes sense. After all, the field is still pretty new. Pain medicine as a specialty did not get off the ground until after World War II, when the anesthesiologist John Bonica published the first textbook on pain management, relaying what he had learned from treating wounded soldiers. That was 1953. Even now, pain specialists in the United States are rare as hen’s teeth, numbering about 2,500.

As part of the foundation for her book, Thernstrom spent a substantial amount of time conducting background research at Tufts. She sat in on PREP classes and observed patients being assessed and treated in the program’s then-operative pain clinic. One thing she came away with most tellingly was the memory of “stricken woe-dermer” she saw on the faces of patients, both at Tufts and elsewhere around the country.

The public toll of chronic pain is immense. More than 116 million Americans struggle with chronic pain each year, and associated medical charges and lost productivity cost the nation as much as $635 billion annually, according to an Institute of Medicine report released last summer. “That’s a conservative estimate of the overall economic impact, because it excludes children, members of the military and individuals in nursing homes or chronic-care facilities,” said Philip Pizzo, chair of the IOM panel that published the report. “We are looking at a broad demography of pain.”

Despite a wide array of techniques that doctors use to address the problem, including (but not limited to) drugs, surgery, targeted injections, physical therapy, ultrasound, acupuncture and meditation, pain is radically undertreated. As one example, a 1998 appraisal of elderly women in nursing homes with metastatic breast cancer found that only a quarter of them had received adequate pain treatment; one fourth got no treatment at all. A survey conducted by the Stanford University Medical Center in 2005 found that only 50 percent of chronic pain sufferers who had spoken to a doctor got what they felt was sufficient relief.

These findings were by no means aberrations. Melanie Thernstrom, a New York Times contributor in her 40s with ample time and money, ruefully describes bouncing from one recommended specialist to another around the country over the past decade without much success, flailing and helpless in her pain.

But what of pain that persists? The longer it endures, the more excruciating the exile becomes.” —MELANIE THERNSTROM
The brain damage may come as a surprise. But when pain researcher A. Vania Apkarian at Northwestern University compared brain images of normal subjects with those of 26 patients who had suffered unrelenting back pain for more than a year, his scans revealed that chronic pain had dramatically reduced the gray matter of the patients’ brains. While normal aging causes gray matter to atrophy by approximately half of 1 percent a year, the gray matter of the chronic pain patients showed losses between 5 and 11 percent, the equivalent of 10 to 20 years’ worth of aging.

That wasn’t all. While normal aging causes atrophy in areas throughout the brain, chronic pain concentrates its damage in those parts of the brain devoted to modulating pain. Pain worsens, in other words, because of the intended function of the brain matter that has been lost. First, intense pain makes its presence felt; as one consequence, brain matter is eaten away; the pain becomes more acute; more brain function is destroyed, and so forth in a downward spiral.

Another complication stems from nervous system efficiency. The longer that nerves carry pain messages along their routes, the more efficient those pathways become. Recent research conducted at the University of California, San Francisco, has found that progressively deeper levels of pain cells in the spinal cord are activated the longer an injury is sustained.

“Chronic pain is like water damage to a house,” confirms Daniel Carr, professor of medicine at Tufts, director of the PREP program and a nationally known pain expert. “If it goes on long enough, the house collapses. By the time most patients make their way to a pain clinic, it’s very late.” In her book, Thernstrom underscores Carr’s observation by describing the more than 100 patients she met at pain clinics around the country. They were frequently shattered and weeping. Many had lost their jobs, their friends, their marriages or their homes as a consequence of the wrenching pain they bore.

Perhaps surprisingly, these patients were often stumped when asked to describe their pain. Language turns out to be a recurrent problem in the field. A doctor will typically ask a patient to locate his or her pain on a scale of one to 10. In many cases, that’s about as far as the conversation goes, or can go. Medical disbelief in a patient’s words, because of the intended function of the brain matter that has been lost. First, intense pain makes its presence felt; as one consequence, brain matter is eaten away; the pain becomes more acute; more brain function is destroyed, and so forth in a downward spiral.

When someone learns they have metastatic cancer, the initial suffering is tremendous. That person thinks, “Wow, I may not be around much longer.” In time, however, that person acquires resilience and understanding. “If those parts can be built up, the suffering can go down, and so can the pain,” she says.

FAR-FLUNG SUFFERERS

A feeling of connection made the difference. Remember Pam Ressler and her son Nick in the hospital room? After she entered the PREP program and immersed herself in chronic pain and the largely uncharted world of those suffering from pain, she became even more ardently committed to the idea of using the Internet to reach those people and reduce their isolation. She had seen it work with Nick, so she figured it should work on a larger scale as well. “Tell the patient’s story and allowing them to have a voice is essential to the treatment of pain,” says Ressler, now an adjunct lecturer in the PREP program.

One proof of this lay in blogging. Last summer Ressler and some colleagues conducted a survey of 230 chronic illness and pain sufferers who had turned to the web for self-expression. Diseases or conditions represented among the bloggers included cancer, diabetes, fibromyalgia, Parkinson’s, lupus, rheumatoid arthritis, cystic fibrosis and cerebral palsy, among others. A general finding of the survey confirmed Ressler’s belief that blogging relieved personal isolation while providing a renewed sense of purpose. “First, I was helped, now I am helping... a reminder that I am part of the world,” wrote one respondent.

Ressler has taken the concept further in recent days by guest-hosting the weekly Wego Health/Health Activists tweet chat under the auspices of the PREP program (follow on Twitter @wegehealth). For a newcomer, it is eye-opening to enter this virtual community and see the many ways that participants can help each other, even in the abbreviated 140-character Twitter format. “We need to expand our toolbox for chronic pain,” Ressler suggests at the start of a recent hourlong chat. “Meditation, yoga, tai chi, all can play a role.” A few seconds elapse before someone tweets in response, “I totally agree. We also need to add diet changes to our toolbox.” Another person tweets: “This month I have been learning meditation and taking a chronic pain yoga class. BOTH are helping to relieve my pain!”

The conversation proceeds at a rapid clip. Often the only trace of individual complaint comes through the contributor’s Twitter handle of “@arthritisashley” or “@lupusrgrl.” It’s easy to imagine these people lying in bed at home or seated at work (do their friends and colleagues know their medical history?) or cruising along a country road anywhere on earth. The distribution of tweeters is global. When one tweeter laments the high cost of his institutional dealings with chronic pain, another tweeter answers, well, that doesn’t apply to her, allowing them to have a voice is essential to the treatment of pain,” says Ressler, now an adjunct lecturer in the PREP program.

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Ressler distinguishes between pain and suffering, which in common parlance seem welded together. They are separate. “We can address suffering, but often we don’t,” she says, offering an example. When someone learns they have metastatic cancer, the initial suffering is tremendous. That person thinks, “Wow, I may not be around for my daughter’s graduation. My time may be limited.” But then, over time, that person acquires resilience and understanding. “If those parts can be built up, the suffering can go down, and so can the pain,” she says.

Bruce Morgan, the editor of this magazine, can be reached at bruce.morgan@tufts.edu.
I’m sitting in gridlock in Boston’s Chinatown neighborhood on a Thursday afternoon. It’s a typical Boston rush hour—traffic isn’t so much driving as oozing through town. Less than a block away, Interstate 93 is in even worse shape; a snarl of commuters is beginning a painful crawl home to the suburbs.

Thankfully, I’m not behind the wheel. I’m in the back of a 26-foot RV driven by Tufts environmental engineering student Jess Perkins, E12, and recent grad Dana Harada, A11. They are regulars in Chinatown. But unlike scores of frustrated commuters on I-93, they don’t have a destination. They simply drive in circles. “It’s like going on a road trip twice a week,” says Perkins. Sometimes the two listen to country; mostly, they just talk.

With every lap through Chinatown, Perkins and Harada are hard at work, collecting air-quality data for a five-year interdisciplinary study based at Tufts called the Community Assessment of Freeway Exposure and Health (CAFEH). The goal of the study, expected to wrap up a year from now, is to understand how vehicular pollution affects the health of people living close to a highway.

Over four years, the RV has racked up more than 15,000 miles circling the Boston-area communities of Chinatown, Dorchester, Somerville and Malden. Behind the driver’s seat, where I’m sitting, a mobile laboratory measures airborne pollutants: gases, such as nitrogen oxide and carbon monoxide, and tiny solids called ultrafine particulate matter. Of the three, the ultrafine particulates are arguably the biggest threat to public health.
“When it comes to air pollution, the main thing that really affects people is particulates—not gases,” says Doug Brugge, the study’s principal investigator and a professor of public health and community medicine at Tufts.

Because of their small size—some are just a few molecules across—tiny particulates are essentially minuscule bullets, delivering toxins deep into the body where larger particles can’t reach. “The Environmental Protection Agency estimates that they cause 80,000 or 100,000 deaths a year in the United States, and maybe four million or more worldwide,” Brugge says.

Tracking air pollution today is a far more subtle job than monitoring the haze of pollutants a few generations ago ever was. Before the U.S. government first allocated funding for air pollution research, in 1955, entire regions could be swallowed by smoke and smog. In 1948, residents of Donora, Pa., a mill town just south of Pittsburgh, woke to a dense cloud of particulate pollutants that had become trapped in the Monongahela River valley by stagnant weather. When the smog lifted five days later, 20 people were dead, and nearly half of the town’s 14,000 residents had fallen sick.

It was one of the worst air pollution disasters in U.S. history, and its impact on public health was easy to see: “You didn’t have to do statistical analysis. You could just see people come to the hospital and die,” says Brugge.

Although U.S. environmental regulations have gotten the big, visible clouds of particulates, such as the industrial sulfur dioxide emissions that contributed to the Donora crisis, under control, Brugge believes there’s still plenty of cause for alarm.

Over the last 30 years, growing numbers of studies have shown that smaller particulates emitted by trucks and cars barreling down our nation’s highways can promote heart disease and strokes. The EPA regulates these tinier hazards, to a point, but Brugge is concerned that the agency hasn’t gone far enough to safeguard the health of roadside residents.

About 10 percent of the U.S. population—some 35 million people—live within 100 meters of a four-lane highway, according to the EPA. Brugge’s hope is to clarify the implications of this fact by measuring the airborne particulates along the road while monitoring the health of people who live in the vicinity. It’s a task requiring both patience and precision.

SMALL, SMALLER, SMALLEST
Particulates come in a few different flavors, each smaller than the next, and each with its own implications for public health. Coarse
particulates (known as “PM₁₀” in the public health world) measure about 10 microns across—roughly one-seventh the width of a human hair. They’re mostly made up of dust from construction, vehicular tire and brake wear and the road surface itself. As particulates go, they’re not as high on Brugge’s hit list.

It’s the really tiny stuff, he says, that poses the real danger: fine particulates (PM₁₅) — particles smaller than 2.5 microns—and “ultrafines” (PM₀.₁), the smallest of the small, at 0.1 microns and below. These are created almost exclusively by combustion. As a car or truck engine runs, its exhaust gases condense into minuscule blobs within seconds of leaving the tailpipe. Some blobs are made up of unburned oil and gasoline; others form out of the countless chemical byproducts of burning fossil fuels.

When they’re inhaled, it’s not just the lungs that take a hit, Brugge says. It’s mainly the heart that suffers. “Most of the mortality, most of the economic impact [of fine and ultrafine particulates] are coming from cardiovascular disease,” he observes. “It’s not primarily asthma or lung cancer.”

Throughout the 1980s and early ’90s, dozens of studies found links between fine particulate pollution and cardiovascular health. One of the largest and most influential of these, the Harvard Six Cities Study, followed more than 8,000 participants in six towns across the Midwest and New England. Over 15 years, the initial phase of the study tracked each person’s health and measured particulate levels in the air over their communities. Its findings, first released in 1993, showed that even a minuscule increase in fine particulates (just 10 micrograms per cubic meter of air), could cause up to an 18 percent bump in cardiovascular disease.

With research like this confirming the health impact of fine particulates, the EPA finally began to regulate them in 1997. Yet Brugge says there’s reason to think that ultrafine particles, which the EPA does not regulate, are even more insidious than their larger counterparts.

Unlike fine particulates (PM₁₅), which don’t change much from day to day, ultrafines can fluctuate dramatically over the course of a morning or afternoon, depending on the weather and how many cars and trucks are on the road. Ultrafines are also confined to a relatively small area. While fine particulates disperse over an entire city, its tinier cousins stick close to major highways, often spiking dramatically within a few hundred meters of the source.

Short distances do matter. During one winter rush hour, as the Tufts mobile testing lab drove within 100 meters of Interstate 93, it tallied more than 120,000 ultrafine particles in every cubic centimeter of air. Moving a few blocks farther away, that number dropped dramatically—to less than 40,000 particles. The reduction might be a result of new particles evaporating, condensing into larger particles, or—most likely—mixing with fresh air as they drift away from the road.

The reduction might be a result of new particles evaporating, condensing into larger particles, or—most likely—mixing with fresh air as they drift away from the road. But Brugge says one thing is clear: Because ultrafines are mostly concentrated near their source, people living and working immediately next to a highway will disproportionately suffer their effects.

“Most of the mortality, most of the economic impact [of fine and ultrafine particulates] are coming from cardiovascular disease. It’s not primarily asthma or lung cancer.”

—Doug Brugge
MATTERS OF THE HEART
At first glance, the health impact of fine and ultrafine particulates seems counterintuitive. Breathing particles of any sort should cause problems in your lungs, not heart, right? But like most things in medicine, it’s not so simple.

Fine and ultrafine particulates both cause cardiovascular disease in similar ways. Once they hit your lungs, your body immediately recognizes that something is amiss. “It essentially says, ‘Oh, crap, something’s wrong here,’ and releases cytokines, molecules that control immune response,” says David Weiss, MD/MPH ’12, who works on the CAFEH study analyzing health surveys generated as part of the community outreach component of the research project. Those cytokines are used to summon help to the site of the infection, but also affect the activity of the immune system throughout the body.

Weiss likens the body’s reaction to the terror-alert system that was put into place after 9/11. “You know, the one that was green, yellow, red,” he says. “The higher levels of cytokines will take you from a level green to a level yellow.” In other words, your whole body goes on high alert, causing elevated levels of inflammation.

Of course, not all inflammation is bad, says Doug Brugge. On a very simplistic level, if you cut your finger, within a day, you’ll see some inflammation (redness) around the cut as your immune system mobilizes to kill any invading bacteria. “That is an example of a good inflammatory response, because it’s localized,” says Brugge. “It’s responding to a real problem, and it’s controlled. It has a beginning and an end.”

But constant exposure to fine and ultrafine particulate pollution can cause chronic inflammation. If that happens, white blood cells called macrophages, which are part of the body’s natural defense mechanism, go into overdrive, seeking out bacteria or other foreign objects in the bloodstream. They start attacking whatever’s there with extra gusto—including certain types of cholesterol that accumulate in the bloodstream. As macrophages gorge themselves on this fatty molecule, they (and their cholesterol contents) settle into the inner lining of blood vessels, where they slowly build up and create artery-clogging plaques.

Weiss says that some of these deposits may happen anyway as the body ages, but inflammation caused by particulate pollution speeds the process, leading to premature heart attacks and strokes.

In this regard, fine and ultrafine particles have identical effects on the body. The big difference between them is their size. The smaller the particle, the more exposed surfaces they have collectively. That means they’re more likely than larger particles to react with chemicals in the body that trigger an immune response. Essentially, Weiss says, this gives the pollutants that make up ultrafine particles more bang for their buck. They’re more potent than larger particles, so they may lead more quickly to heart disease. And, he adds, they may be small enough to get directly into the bloodstream, where they can do even more damage.
Larger particles can’t cross the barrier from the lungs to the bloodstream,” says Weiss, “but the ultrafine particles can. So because of that, and partly because of their increased exposed surface area, there’s more of an opportunity for them to have reactions that will cause inflammation.” The only way to avoid this inflammation—short of somehow removing particles from the air around you—is to spend less time near major highways.

“For people who move away from the highway, it’s like they quit smoking,” says Wig Zamore, a longtime resident of Somerville with a master’s degree in urban planning. Over the past decade, Zamore has worked with community groups on public health and clean-air issues, and is a member of the CAFEH steering committee, a group of academics and community members who help guide the study’s research. “Their risk pretty immediately starts to go down, and for the people who move closer to a highway, their risk immediately starts to go up over a matter of just a couple years,” he says, citing a 2009 study by the University of British Columbia.

The problem is, of course, that many people living near highways don’t have the financial means to move. According to Zamore, of the 35 million Americans who live by a major four-lane highway, roughly 18 percent are renters or live in low-income housing.

COMMUNITY ACTION
Tina Wang deals with new immigrants in Chinatown every day as a translator for the Chinese Progressive Association, a neighborhood advocacy group. Four years ago, she moved to the United States from China. She says that most of the community members she knows are aware that living near a major highway isn’t great for their health, but they simply have nowhere else to go.

“One man told me, ‘How can I leave? I don’t have more money to move out. I [waited] more than five years to get this low-income apartment.’ He knows there’s pollution from the highway. He knows it’s not good. But he asks me, ‘What else can I do?’ ”

Wang is a member of CAFEH’s field staff, a group of 23 people who live mostly in the study’s target neighborhoods. To assess the health impacts of ultrafine particulates in those areas, CAFEH not only needs air samples; it needs biological data, too—so members of the field team go door-to-door, convincing neighbors to answer medical questionnaires, submit to blood pressure tests and give blood samples during weekly clinics held at a central location in each participating neighborhood.

Over four years, the field team has canvassed Somerville, Dorchester, Chinatown and Malden—all areas where the CAFEH RV has collected air-quality data. So far, they’ve recruited 700 participants, 450 of whom have attended the CAFEH-run clinics.

“To our knowledge, our study is the only one that’s both measuring ultrafines near the highway and looking at biological markers of people living in those areas,” says Brugge. That’s only part of what makes the study distinctive, he says. CAFEH’s philosophy is to involve community members not just as sources of data, but also as colleagues in its research, as Tina Wang and Wig Zamore are.
Other researchers in the public health community are taking notice. “[CAFEH] is pretty unique in terms of its blend of hard-science approaches and attempts to both use community residents and keep the community informed throughout the project,” says Jonathan Levy, a professor of environmental health at Boston University, who is on the thesis committees of two Ph.D. students working with CAFEH—Allison Patton from Tufts School of Engineering and Kevin Lane at the BU School of Public Health.

The benefits of collaboration are many. As Tina Wang sees it, even a task as simple as filling out a survey or giving blood can help embolden those involved. “[Chinatown residents] don’t have high expectations for the government doing something for Chinatown. But if they can do a little bit for the community, [by participating in the study], they feel powerful.”

One City’s Response

Some communities aren’t simply waiting for the final results before they do something. Tucked into a bend in the Mystic River lies Somerville’s Ten Hills neighborhood—a tiny, wedge-shaped slice of land covering 50 acres. The mayor of Somerville calls it home, as do two city aldermen. Driving through, it’s easy to see why there’s an allure to the place. Its trim streets are lined with trees, and people wave to each other in the parks and running trails that flank the river. It’s a gem of a neighborhood. But at 5 p.m. on a Tuesday, with almost no visible traffic nearby, you can hear the steady drone of car and truck engines.

Ten Hills is cut off from the rest of Somerville by two major highways. To the east, it’s hemmed in by Route 28, which brings traffic across the Mystic River and into the neighboring city of Medford. To the south, it stops abruptly at Interstate 93.

Somerville Mayor Joseph Curtatone is incensed about the interstate. He was just 7 years old when it opened in 1973, splitting the city in two. Nearly 40 years later, he still hears complaints about the highway from his neighbors. “It really changed the canvas of the city,” he says. “Today, people sort of accept it in bewilderment, and say, ‘How the hell did anyone ever make that decision? How did this happen?’ [The highway] isn’t really servicing neighborhoods; it’s isolating them.”

And, he adds, it has a distinct impact on the health of Somervillians. The city is the most densely populated in New England, and with some 75,000 people concentrated on just four square miles of land, more than 11 percent of residents live within 400 meters of a major highway, according to estimates drawn from recent census data. Curtatone is hoping that the CAFEH study results, once published, will help guide city policy to mitigate the effects of pollutants from these roadways. Until then, his team at city hall is working with Brugge on finding interim solutions.

Emmanuel Owusu, Somerville’s program manager for public housing, has already begun examining ways to improve indoor air quality near the highway. He’s focused his attention on the city’s largest public housing project, the Mystic River Development, which sits right next to I-93. As is the case in the Ten Hills neighborhood, a front yard and a sidewalk are the only barriers separating the apartments from a highway traveled by

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**About 10 percent of the U.S. population—some 35 million people—live within 100 meters of a four-lane highway.**
an average 168,000 vehicles each day, according to the Massachusetts Department of Public Health.

With a grant from the U.S. Department of Housing and Urban Development (HUD), Owusu is working with Tufts environmental engineer John Durant and the community advocacy group STEP (Somerville Transportation Equity Partnership) to study the effectiveness of window filtration units installed in the Mystic River apartments. They’re small, about the size of an average air conditioner, but Owusu says they’re making a big difference in the overall indoor air quality.

“We’ve already seen a 35 percent reduction in particles in the rooms where we’ve run the filters,” says Owusu. “HUD is watching the outcome of this study. If it’s successful, it means indoor air filtration could go a long way to help the pollution issue we have at hand, not only in Somerville, but across the nation.”

There may be other solutions. A study by the National Oceanic and Atmospheric Administration found that erecting tall sound barriers between highways and the people who live near them could contain most ultrafine particles inside highway boundaries. Another study from the University of California, Davis, experimented with trees as a natural barrier. Redwoods, researchers found, can remove up to 80 percent of ultrafines. But mitigation efforts such as these can go only so far. Kevin Stone, a field team member for CAFEH, has lived in the Ten Hills neighborhood for 25 years. He says that many of his neighbors simply haven’t heard about the potential health risks of living near a highway.

“This one friend of mine lives at the top of the hill, right next to the highway. He’s got all his windows wide open, and he’s saying, ‘Isn’t this just a great view of Boston?’ ” Stone laments, shaking his head. “I’m saying to myself, ‘You don’t even realize what you’re sucking in right off of I-93. You’re getting really exposed to this stuff!’ ”

At the very least, Stone says, he’d like to see warning signs posted on the bike path that runs alongside the interstate. It’s a small gesture, but it is something that would give residents an idea of what they might be breathing during rush hour.

Researchers with the CAFEH project are just beginning to sift through terabytes of air-pollution data from the RV and hundreds of blood samples from participants. They’ve released several preliminary papers this year, and are working toward presenting the study’s main findings in summer 2013.

Levin is a freelance science writer based in Boston.
It’s long been known that developmental disorders run in families, but pinpointing genetic culprits is no small task. Monaco and his laboratory have taken several quite different approaches. To track down the genes associated with autism, for example, they homed in on chromosome abnormalities that occur when cells divide, causing breaks in genes or changes in their number, for example by deleting a copy. Scrutinizing those chromosome abnormalities turned up single genes, or sometimes a group of genes, that influence susceptibility to autism in 15 to 20 percent of cases.

In another case, involving a family with a rare speech and language disorder, Monaco and his colleagues narrowed the cause down to a single gene, FOXP2. An abnormality in that gene could signal whether a member of the family would inherit the language problem, even before any symptoms appeared. By studying the FOXP2 gene in songbirds, mice and monkeys, the researchers gained insights into the gene’s role in vocalizations throughout evolution and how language developed in humans. “It’s allowed us at least one entry point to start to dissect the biological pathways inside the brain involved in speech and language,” Monaco said.

Dyslexia is another neurodevelopmental disorder with a genetic component. Monaco’s team managed to identify one of four genes apparently associated with the disorder. Studies show that the gene affects how neurons form in the fetal brain. It “might be involved in the correct adherence and migration of neurons,” Monaco said. With all of these disorders, early detection can be key to improving outcomes. The contributions Monaco and other genetics researchers are making to the field eventually could lead to screening techniques that would improve diagnosis and give doctors better insight into potential treatments.
It’s an old debate: heredity versus environment. Which of the two exerts the greater influence on the individual has proved to be even more complicated than once believed, according to Rutter. While psychiatrists have fixated on either biological or environmental causes of mental disorders, most such conditions now appear to stem from a complex interplay between the two.

Many of the newer findings have come from “natural experiments,” studies that compare naturally occurring groups so as to isolate genetic effects—the children of twins, for example, or children born of artificial insemination versus children of donated eggs. Previously, some clinical studies suggested that ADHD or antisocial behavior may be caused by a mother’s smoking during pregnancy—an environmental factor, in other words. But these newer studies have shown that children with certain genetic profiles suffer no such ill effects from their mothers’ smoking, although there is an effect on birthweight. In those cases, genes trump environment.

Sometimes, the opposite seems to be true. Childhood depression was long thought to be genetically determined, but new studies show that environmental factors are twice as important as genetic predisposition in determining whether a child is diagnosed with the disease. In some cases, genes and environment can have a multiplier effect, exponentially increasing the chances of developing certain disorders. In still other cases, environmental forces can be canceled out by genetics. A variant of one particular gene, for instance, affects the vulnerability of children experiencing maltreatment, helping them develop resiliency.

All of these findings have dramatic implications for treatment—allowing better targeting of certain disorders. But first, Rutter said, doctors must abandon their old notions of nature or nurture in favor of a more individualized approach that sees the two as inseparable.

To most of us, reading seems such a basic brain function that we hardly stop to think about how we learned to do it. In fact, said Wolf, human beings aren’t born with any inherent ability to read text. Rather, we all jury-rig unrelated parts of our brain—those in charge of visual recognition of shapes, phonological recognition of sounds and higher cognitive functions for comprehension and syntax—into a complex circuitry that decodes the sentence you are reading now in a matter of milliseconds.

“Each new reader,” Wolf said, “must create an entire reading circuit”—usually between ages 5 and 7. “It took us 2,000 years as a species to get to an alphabet,” she said, referring to the evolution from symbolic writing, such as hieroglyphics or cuneiform to the first real phonetic writing system, developed by the Greeks around 800 B.C. But a child must go through a similar cognitive evolution in just 2,000 days.

It’s no wonder that this complicated process sometimes goes haywire, causing reading disorders. Brain scans have shown that many dyslexic children fail to activate areas in the left hemisphere for phonological skills that help in sounding out letters; instead, they use areas in the right hemisphere keyed to visualization. Wolf and her colleagues have devised ways to rewire those faulty pathways. Putting children through a special curriculum that breaks down each stage of the reading process into specific techniques, mimicking the sequence of activities in the brain, the researchers have seen marked improvement in both word recognition and reading comprehension.

Her latest studies look at how the daily bombardment of technology is affecting children’s reading development. “Is that going to be changing the degree to which they possess the deep reading skills?” she asked. In other words, how will all of the circuitry we’ve created for computers affect the circuitry we’ve created in our brains?
TREAT THE FETUS

DIANA BIANCHI, EXECUTIVE DIRECTOR, MOTHER INFANT RESEARCH INSTITUTE, TUFTS MEDICAL CENTER; NATALIE V. ZUCKER PROFESSOR OF PEDIATRICS, OBSTetrics AND GYNECOLOGY, SCHOOL OF MEDICINE; VICE CHAIR FOR RESEARCH AND ACADEMIC AFFAIRS, DEPARTMENT OF PEDIATRICS, FLOATING HOSPITAL FOR CHILDREN (“TREATMENT OF DEVELOPMENTAL DISORDERS USING A PREGNATAL GENE EXPRESSION APPROACH”)

The joy of a new pregnancy is often overshadowed by The Test—routine prenatal screening for Down syndrome. If the result is positive, the parents must choose whether to continue or terminate the pregnancy. Bianchi is working on a third option: treating the condition in the womb. Her lab has been looking for drugs that, given to the pregnant woman, might counteract some of the biochemical abnormalities seen in Down fetuses. Examining RNA that floats in the amniotic fluid, Bianchi and her team found that genes in such fetuses are affected by something called oxidative stress—a byproduct of oxygen metabolism that creates destructive chemicals. The researchers plugged the gene expression profiles of the affected fetuses into a database of all FDA-approved drugs, searching for any that might stop the oxidative effects.

Sure enough, several drugs popped up. In early results, one of the drugs greatly reduced oxidative stress in cells from Down fetuses in the test tube. Now Bianchi’s team is experimenting with mice. “To the best of our knowledge, this is the first time anyone has tried to use a gene expression rationale for treating a genetic condition in utero,” Bianchi said. If it works, the same techniques could be used to treat other birth defects, perhaps opening up a whole new field: prenatal pediatrics.

GROWING UP, NOT OUT

CHRISTINA D. ECONOMOS, N96, DIRECTOR, CHILD OBESEITY180; NEW BALANCE CHAIR IN CHILDHOOD NUTRITION, FRIEDMAN SCHOOL OF NUTRITION SCIENCE AND POLICY; ASSISTANT PROFESSOR OF FAMILY MEDICINE AND COMMUNITY HEALTH, SCHOOL OF MEDICINE (“TACKLING A CRISIS: A SYSTEMS APPROACH TO OBESITY PREVENTION”)

Everybody talks about childhood obesity. Economos has dedicated herself to actually doing something about it. A decade ago, she helped put together a community research study in Tufts’ home base of Somerville, Mass. Shape Up Somerville since has become a national model. Aimed at getting children to eat healthier foods and increase physical activity, the program used a “systems” approach, tackling all sides of the obesity issue at once. Parents plotted walking routes to schools, the schools switched to healthier menus and doctors were trained in more effective screening for obesity. Even local restaurants got in on the act, offering smaller portions.

After the first year, the study showed a drop in obesity that translated into about a pound per child per year compared with two neighboring towns—a significant amount over a childhood. “It’s exactly what we hoped for,” said Economos. When Michelle Obama launched a national campaign to combat childhood obesity, she singled out Shape Up Somerville for praise. Economos is now developing a national “playbook” for tackling the problem, recognizing that just as there is no one cause for the obesity epidemic, so there is no one-size-fits-all solution.

VITAMINS FOR TEETH

HUW F. THOMAS, DEAN AND PROFESSOR OF PEDIATRIC DENTISTRY, TUFTS UNIVERSITY SCHOOL OF DENTAL MEDICINE (“EARLY CHILDHOOD CARIES: THE ROLE OF NUTRITION”)

The most common disease of childhood isn’t asthma or diabetes. It’s early childhood caries, more commonly known as tooth decay. By age 5, some 25 percent of affluent children show some signs of the disease—caused by bacteria that turn sugar into acid, which breaks down the enamel on the teeth. Among poor children, however, the disease is epidemic, affecting 60 percent of them by age 5. Some children exhibit signs of decay before their first birthday. “This disease shows no age limitations,” said Thomas.

While many studies have examined the role of sugar or improper bottle feeding in causing cavities, Thomas has focused on a less intuitive cause, deficiency of vitamin D, a problem that particularly affects poor communities due to inadequate nutrition. Experimenting with mice that can’t metabolize vitamin D, Thomas has shown dramatic differences in their tooth enamel compared
LEARNING FROM ANIMALS

LISA FREEMAN, J86, V91, N96.
PROFESSOR OF CLINICAL SCIENCES, CUMMINGS
SCHOOL OF VETERINARY MEDICINE, TUFTS (“CHILD
DEVELOPMENT: LINKING HUMAN AND ANIMAL HEALTH”)

“You may be wondering why you have a veterinarian talking to you at a symposium on child development,” said Freeman. “It all boils down to the idea of One Health.” It’s the proposition that studying animals can yield insights into the treatment of human disorders, including developmental ones. The concept has been championed by Tufts and by Freeman in her research on animal nutrition.

One disease that affects both animals and humans is hypertrophic cardiomyopathy (HCM)—a heart condition that can cause sudden cardiac death in young athletes. Maine coon cats have a genetic mutation that renders them more susceptible to the disease, and Freeman has studied them intensively. An intriguing finding: some cats with the mutation get very sick and others not at all. Why? Possibly because of differences in nutrition, Freeman said.

In all sorts of animals, malnourishment during early development can interfere with important processes such as DNA repair and cell growth cycles. “Low birth weight in children can increase the risk for coronary heart disease and hypertension in later life,” Freeman said. The research on HCM could open up new treatment methods both for cats and for humans.

Sometimes pets play a therapeutic role for humans. People who want to shed pounds, for example, are more successful if they are also trying to help their tubby dog or cat lose weight. Pets can even help children learn to read. “Dogs are nonevaluative, nonjudgmental listeners,” Freeman said. “So children who lack confidence or lack reading skills are very comfortable reading to dogs.” Freeman and her colleagues found that second-graders who read to dogs became better and more dedicated readers than those who read to other people. There is no word yet on how this affected the literacy of the dogs.

BUILDING SCHOLARS

CHRIS ROGERS, PROFESSOR OF MECHANICAL ENGINEERING AND DIRECTOR, CENTER FOR ENGINEERING EDUCATION AND OUTREACH, SCHOOL OF ENGINEERING, TUFTS (“KINDERGARTEN ENGINEERING: MOTIVATING CREATIVITY AND INNOVATION IN THE CLASSROOM”)

A local first-grade teacher gave her pupils Lego blocks, gears and a mechanical motor, and asked them to make a snowplow to push Styrofoam packing peanuts out of the way. Most of the kids aced the assignment. But then she made the peanuts heavier by soaking them in water. Now only a few kids, those who had used geared wheels for more power, succeeded. “All of a sudden,” Rogers recounted, “they were really interested in what gears were.”

That hands-on lesson is typical of the way Rogers and his outreach team teach mechanical and mathematical principles to young children. They set a goal, encourage as many routes to that goal as possible and then let the kids keep trying until they succeed.

When kids learn with their hands, they retain more. Children who learned fractions from a blackboard did just as well on a math test as those who learned fractions by programming a Lego robot car to travel different distances. But tested again six weeks later, the Lego kids remembered almost twice as much as the blackboard kids.

Such methods aren’t easy to integrate into a classroom geared to standardized tests, so Rogers and the center have developed teaching tools, training programs and online communities to help teachers adopt the techniques. Ultimately, he’d be happy if standardized tests favored creative problem-solving. “If we can try and get as much variation in the solutions as possible, instead of one right answer,” he said, “then I think we’ve succeeded.”
on campus

Bench to Bedside—and Beyond

The Tufts Clinical and Translational Science Institute does more than build bridges between research and patients; it examines health care from fresh angles by Jacqueline Mitchell

Because nearly a quarter of all kidney dialysis patients die each year, these terminally ill patients and their families face some tough decisions: Should they continue treatment? Draw up a health-care proxy? What about hospice care?

"Once we know who is likely to die, we should be putting our most rigorous efforts into end-of-life care for them," says Lewis Cohen, a palliative care specialist who helped develop a diagnostic tool that predicts which dialysis patients are most likely to die within six months of beginning treatment. That may sound grim, but Cohen, a professor of psychiatry at Tufts School of Medicine and a clinician-researcher based at the Tufts-affiliated Baystate Medical Center in Springfield, Mass., says it "opens up an opportunity" to help patients and their families negotiate a difficult time.

Cohen and biostatistics expert John L. Griffith, an associate professor at the medical school, developed a series of interventions to help doctors and nurses ease dialysis patients' anxieties and fears and get them the information they need to make their end-of-life decisions. They encouraged collaborations between hospital staff in the dialysis unit and community hospice workers, who assisted patients and their families in working through end-of-life issues.

When Cohen needed to assess the effectiveness of such interventions, he turned to the Tufts Clinical and Translational Science Institute (CTSI), an NIH-funded enterprise...
to encourage experts from different fields—such as a psychiatrist and a kidney specialist—to work together to examine health-care issues from fresh perspectives.

One of 60 such centers across the country, the Tufts CTSI provides research teams such as Cohen’s with the education, research expertise and pilot grant awards they may need to turn their good ideas into new practices or policies. That’s both the mission and definition of translational science: quickly getting high-impact, often cost-effective approaches to health care out of the lab and to the patient—often short-handed as “bench-to-bedside”—as well as supporting interventions such as Cohen’s that improve medical practice.

Cohen and his colleagues received a CTSI Catalyst Pilot Grant in September 2012 to roll out small studies at several dialysis centers in western Massachusetts affiliated with Baystate Medical Center and Berkshire Medical Center.

Testing their protocol in the real world gave the scientists the chance to iron out unforeseen logistical problems. Now, in collaboration with kidney specialists from the University of Pittsburgh and Stanford Medical Center, Cohen and Griffith will apply in June for a $4.5 million, five-year grant from the National Institute of Diabetes and Digestive and Kidney Disorders to run large-scale trials of the interventions.

Data from the CTSI-sponsored study strengthens the group’s NIH application, Cohen says, improving their chances of obtaining federal funding. “Because of this catalyst grant, we are in an excellent position that I know we would not have been without Tufts CTSI,” he says. “It was absolutely essential.”

TEAM SCIENCE

With the goal of making headway on such complex medical problems as cancer, diabetes and heart disease, the National Institutes of Health in 2006 announced a plan to create a nationwide consortium of clinical and translational research centers. NIH funding for such centers, including the one at Tufts, encourages not only a wide range of cross-disciplinary research, but also community-engaged research—that is, research done in concert with leaders in industry and government as well as with community programs and religious, ethnic and other interested groups.

Tufts received its grant to create a CTSI in 2008, but the university already had a well-established tradition of translational research, says Harry P. Selker, dean of Tufts CTSI and a professor of medicine.

The Sackler School of Graduate Biomedical Sciences has stressed interdisciplinary research since its founding in 1980. Under its first dean, Louis Lasagna, Sackler became the first graduate school of biomedical sciences to offer a degree in clinical research.

Out of this tradition came projects such as Shape Up Somerville, a collaboration of researchers at the Friedman School of Nutrition Science and Policy and city officials and residents in Somerville, Mass., that has become a national model in the campaign to combat childhood obesity. While Shape Up Somerville predates Tufts CTSI, it’s the perfect example of the type of community-based, cross-disciplinary, collaborative work CTSI wants to foster.

“We don’t just focus on bench to bedside,” says Selker. “We go all the way from bench to bedside, bedside to practice, practice to public policy and public benefit. That’s the focus of Tufts CTSI: finding the best medicine or treatment or strategy for health.”

In addition to 10 Tufts schools and centers, the Tufts CTSI encompasses 10 affiliated hospitals, nine community organizations, three academic partners and three industry partners. That’s a total of 35 institutions, ranging from Maine Medical Center in Portland to the Boston Chinatown Neighborhood Association to the pharmaceutical company Pfizer. “That’s probably the most for any CTSI [in the country],” says Selker. “We are known by some as the extrovert CTSI. That’s in keeping very much with the Tufts personality.”

Laurel K. Leslie, director of CTSI’s Center for Aligning Researchers and Communities, helps scientists build relationships with community members, and

“Pulling people together from different perspectives is really important these days,” Laurel Leslie says.

ILLUSTRATION: MIKE AUSTIN
these children—who often suffer significant speech delays—are venting their unspoken frustrations through aggression. But the parents she was working with offered another perspective: Could their kids be acting out because of the severe gastrointestinal issues commonly seen in autism? Leslie was aware of the stomach problems, “but it somehow wasn’t in my framing when I was thinking about how we would approach aggression,” she says. “To make a research project work, I needed to talk to the patients and families to find out what issues they needed addressed.”

For research to really make a mark, the dialogue between scientists and the community needs to continue after a study ends. “One of the problems we have is that researchers do the research, then it [gets published in the professional] journal, and you never see it getting implemented in the real world,” says Leslie.

In a recent collaboration with a multi-disciplinary team of researchers, Leslie and her colleagues made their findings available to those who could put them into action. In 2008, a federal law requiring state child welfare agencies to oversee the use of psychotropic medications by children in foster care left many states scrambling to set up systems capable of keeping track of their wards. To find out which states already had oversight guidelines in place, Leslie and her team surveyed all of them, promising them access to the data in return for their participation. That promise resulted in 47 of the 50 states and the District of Columbia participating.

Some results were published in academic and professional journals, but Leslie and her colleagues prioritized creating a user-friendly document that was sent to all the study participants. Available on the CTSI website (www.tuftsctsi.org), the 24-page report is written for nonscientists: legislators, child welfare agency administrators, foster parents and even foster children themselves. In clear, jargon-free language, the report reveals that 26 of the responding states already had guidelines to monitor use of psychotropic drugs, while 13 states were in the process of implementing such programs. The report also identifies the challenges states encountered, as well as their solutions. It includes questions that state child welfare administrators may use to devise their own systems, such as what state characteristics—rural vs. urban, for example—are important to consider.

“It’s a very practical document. States are looking for guidance so they don’t have to reinvent the wheel,” says Leslie, who adds her research team is now consulting on the federal level as well as for the Massachusetts Office of Child Advocates.

Whether they are investigating the cost-effectiveness of tai chi as a treatment for fibromyalgia or designing a study to prevent heart disease in a specific population, Tufts researchers are taking advantage of what Tufts CTSI can offer them. While the collaborative nature of this kind of work may be a shock to the system at some institutions, translational science is “in keeping with the strengths of Tufts University, our extroversion, our interest in policy and impact on health policy,” says Harry Selker. “That’s kind of our special niche.”

A NEW CAST OF CHARACTERS FINDS MEDICINE

In March, the entire Cathedral High School junior class of 50 students visited the medical school on a full-day field trip. Cathedral, located about a mile away, has been the focus of a cooperative venture between that school’s athletes and Tufts orthopedic students and faculty. The field trip included a lecture given by orthopedic surgeon Dr. Tyler Skaife (below, in white shirt) on sports injury prevention, talks by medical students on anatomy and physical fitness, a health careers panel and a casting lab.

Above, Catherine Logan, ’12, applies a cast to Kenneth Lopez. Right, Skaife demonstrates technique for Sylvia Singleton as, from left, Alexander Rodriguez, Michael Loach, Mohammed Braimah and Rajdel Francois look on.
Once again this year, at high noon on Match Day, March 16, fourth-year students eagerly tore open their respective envelopes. The results have never been better. A record high number of 22 students, or 12 percent of the graduating class, were matched to residency programs in family medicine, approximately four percentage points above the national average for students matching in the field.

In other good news, all 10 students who applied to orthopedic surgery residencies saw their dreams come true. (A complete listing of residency placements appears on the next two pages.) Tufts Medical Center drew 10 percent of the matches, with 11 percent going to Harvard-affiliated hospitals. Geographically, 31 percent of the class placed in Massachusetts, 17 percent will go to New York hospitals, and nine percent will call California home.

More than 95 percent of U.S. medical school seniors matched to a residency position this year, making this the highest match rate in 30 years, according to the National Residency Matching Program.
ARIZONA
Craig WeinKauf, Vascular Surgery
University of Arizona Program, Tucson

CALIFORNIA
Alana Arnold, Pediatrics
Children’s Hospital, Oakland
Kristin Childress, Internal Medicine
University of Southern California Program, Los Angeles
Charlotte Centurei, Ob/Gyn
University of Southern California Program, Los Angeles
Aaron Edelstein, Family Medicine
Kaiser Permanente Program, San Diego
Erin Gonzales, Pediatrics
Stanford University Program, Stanford
David Harrison, Emergency Medicine
University of Southern California Program, Los Angeles
Richard Koff, Diagnostic Radiology
Santa Barbara Cottage Hospital Program, Santa Barbara
Medicine Prelim., University of California Fresno Program
Sofy Landes, Internal Medicine
Cedars-Sinai Medical Center, Los Angeles
Ingrid Larson, Internal Medicine
California Pacific Medical Center, San Francisco
Ryan Lee, Physical Medicine & Rehabilitation
VA Greater Los Angeles Healthcare System Program, Los Angeles
Medicine Prelim., University of California at Irvine Medical Center, Irvine
Vivian Lin, Internal Medicine
Cedars-Sinai Medical Center, Los Angeles
Christine Megerdichian, Internal Medicine
UCLA Medical Center, Los Angeles
Aaron Parrish, General Surgery
Harbor-UCLA Medical Center, Los Angeles
Alicia Parsons, Family Medicine
Ventura County Medical Center Program, Ventura
Rachel Shing, Emergency Medicine
UCLA Medical Center, Los Angeles
Nicole Thom, Internal Medicine
Cedars-Sinai Medical Center, Los Angeles

COLORADO
Kirigin Elstad, Ob/Gyn
Exempla St. Joseph Hospital, Denver

CONNECTICUT
Ashwini Bapat,
Medicine/Primary Care
Yale-New Haven Medical Center, New Haven
Lily Bayat, Ob/Gyn
Bridgeport Hospital/Yale University Program, Bridgeport
Wayne Chan, Orthopedic Surgery
Yale-New Haven Medical Center, New Haven
Shalna Goldsmith, Pediatrics
Yale-New Haven Medical Center, New Haven
Tracy Webber, Orthopedic Surgery
University of Connecticut Program, Farmington
John Williams, Family Medicine
Middlesex Hospital Program, Middletown

RHODE ISLAND
Ryu Yoshida, Orthopedic Surgery
University of Connecticut Program, Farmington

DISTRICT OF COLUMBIA
Alexis Leonard, Pediatrics/Primary Care
Children’s National Medical Center

FLORIDA
Alexander Antoniou, Surgery Prelim
University of Florida Program, Gainesville
Sarah Read, Ophthalmology
University of Miami-Beascom Palmer Eye Institute, Miami
Transitional, Tufts Medical Center, Boston

HAWAI
Andrew Osten, Pediatrics
Tripler Army Medical Center, Honolulu

ILLINOIS
Nisha Chhabra, Anesthesiology
Rush University Medical Center, Chicago
Transitional, Lemu Shattuck Hospital, Boston
Hillary Cohen, Internal Medicine
Rush University Medical Center, Chicago
Rand Dae, Anesthesiology
University of Chicago Medical Center, Chicago
Medicine Prelim., St. Luke’s/Robeest Hospital, New York City
Brandon Erickson, Orthopedic Surgery
Rush University Medical Center, Chicago
Oaoloua Fayanju, Family Medicine
Loyola University Medical Center, Maywood
Stephanie Hocking, Family Medicine
West Suburban Medical Center Program, Oak Park
Alexander Kobizc, Medicine/ Emergency Medicine
University of Illinois College of Medicine Program, Chicago
Richard Matelewicz, Urology
Northwestern University-McGaw Medical Center, Chicago
Surgery Prelim., Northwestern University-McGaw Medical Center, Chicago
Colin McCloskey, Emergency Medicine
Northwestern University-McGaw Medical Center, Chicago
Carolyn Sanderson, Internal Medicine
Northwestern University-McGaw Medical Center, Chicago

LOUISIANA
Claire Lawlor, Otolaryngology
Tulane University Program, New Orleans

MAINE
Elinor Milder, Family Medicine
Maine-Dartmouth Family Medicine Program, Augusta
Ara Parshghian, Anesthesiology
Maine Medical Center, Portland
Gabriela Poles, General Surgery
Maine Medical Center, Portland

MARYLAND
Adam Barelski, Internal Medicine
NCC-Walter Reed National Military Medical Center, Bethesda
Camellia Hernandez, Internal Medicine
NCC-Walter Reed National Military Medical Center, Bethesda

MASSACHUSETTS
Matthew Abrams, Radiation Oncology
Tufts Medical Center, Boston
Transitional, Steward Carney Hospital, Boston
Alicia Agnoli, Family Medicine
Cambridge Health Alliance/Tufts University Program, Cambridge
Azadeh Ahmadian, Internal Medicine
Boston University Medical Center, Boston
Katherine Armstrong, Ob/Gyn
Beth Israel Deaconess Medical Center, Boston
Ozaire Awaids, Neurology
Tufts Medical Center, Boston
Medicine Prelim., Albert Einstein College of Medicine-Montefiore Medical Center, Bronx, N.Y.
Anthony Barton, Internal Medicine
St. Vincent Hospital, Worcester
Neal Biddick, Internal Medicine
Beth Israel Deaconess Medical Center, Boston
Michael Blea, General Surgery
Tufts Medical Center, Boston
Marc Boufard, Neurology
Beth Israel Deaconess Medical Center, Boston
Medicine Prelim., Beth Israel Deaconess Medical Center, Boston
Zachary Camann, Anesthesiology
Tufts Medical Center, Boston
Medicine Prelim., Steward Carney Hospital, Boston
Enrico Castelluccio, Internal Medicine
Boston University Medical Center, Boston
Terra Cederroth, Pathology
Beth Israel Deaconess Medical Center, Boston
Alexander Cohen, General Surgery
Tufts Medical Center, Boston
Steven Constantino, Anesthesiology
Brigham & Women’s Hospital, Boston
Gerard Daly, Internal Medicine
Lahey Clinic, Burlington
Sarah Favilla, Pediatrics
Baystate Medical Center, Springfield
Sean Gallagher, Anesthesiology
Tufts Medical Center, Boston
Medicine Prelim., Steward Carney Hospital, Boston
Michael Genuardi, Internal Medicine
Massachusetts General Hospital, Boston
Robert Goldstein, Internal Medicine
Massachusetts General Hospital, Boston

ON CAMPUS

Farah Khan, Family Medicine
University of Massachusetts Program, Worcester
Adnan Khera, Anesthesiology
Tufts Medical Center, Boston
Medicine Prelim., University of Maryland Medical Center, Baltimore
Richard Krolewski, Neurology
Brigham & Women’s Hospital, Boston
Medicine Prelim., Brigham & Women’s Hospital, Boston
Melissa Le Conducteur, Pediatrics
Massachusetts General Hospital, Boston
B. Minnuk Lee, Internal Medicine
Steward St. Elizabeth’s Medical Center, Boston
Eva Litvak, Anesthesiology
Brigham & Women’s Hospital, Boston
Catherine Logan, Orthopedic Surgery
Harvard Combined Program/MGH, Boston
Xuan Luo, Orthopedic Surgery
Harvard Combined Program/MGH, Boston
Patrick Manning, Internal Medicine
Tufts Medical Center, Boston
Jasmine Mathews, Emergency Medicine
Boston University Medical Center, Boston
Gillian McCafferty, Emergency Medicine
Baystate Medical Center, Springfield
Sarah Nanni, Pediatrics
Massachusetts General Hospital, Boston
Andrew Natanson, Neurology
Tufts Medical Center, Boston
Medicine Prelim., Steward St. Elizabeth’s Medical Center, Boston
Sean Nealy, Urology
Boston University Medical Center, Boston
Surgery Prelim., Boston University Medical Center, Boston
Ryan O’Connor, Psychiatry
Harvard Longwood Psychiatry Program, Boston
Hannah Perry, Diagnostic Radiology
Beth Israel Deaconess Medical Center, Boston
Medicine Prelim., Beth Israel Deaconess Medical Center, Boston
Ashley Peterson, Ob/Gyn
Tufts Medical Center, Boston
Dominic Pisanio, Anesthesiology
Tufts Medical Center, Boston
Medicine Prelim., Lahey Clinic, Burlington
Jessica Ricciuto, Internal Medicine
University of Massachusetts Program, Worcester
Anna Rubin, Internal Medicine
Massachusetts General Hospital, Boston
Matthew Savary, Surgery Prelim
Beth Israel Deacogens Medical Center, Boston
Akriti Saxena, Internal Medicine
Tufts Medical Center, Boston
Reuben Shin, General Surgery
Lahey Clinic, Burlington
Simon Sidelnik, Psychiatry
Massachusetts General Hospital, Boston
Jessica Solomon, Family Medicine
Cambridge Health Alliance/Tufts University Program, Cambridge
Suzanne Sprague, Medicine/Pediatrics
University of Massachusetts Program, Worcester
Jennifer Steinkeler, Diagnostic Radiology
Beth Israel Deaconess Medical Center, Boston
Transitional, Newton-Wellesley Hospital, Newton Lower Falls
Nizar Takl, Otolaryngology
Tufts Medical Center, Boston
Meredith Thomas, Ob/Gyn
Tufts Medical Center, Boston
Christopher Tsang, Otolaryngology
Tufts Medical Center, Boston
Ojas Vyas, Internal Medicine
Tufts Medical Center, Boston
William Wrobel, Diagnostic Radiology
Brigham & Women’s Hospital, Boston
Medicine Prelim., Steward St.
Elizabeth’s Medical Center, Boston
Kevin Yang, Urology
Lahey Clinic, Burlington
Surgery Prelim., Lahey Clinic, Burlington
Lisa Young, Family Medicine
Cambridge Health Alliance/Tufts University Program, Cambridge
Kathryn Zioto, Psychiatry
Harvard Longwood Psychiatry Program, Boston

Yonatan Hillman, Internal Medicine
Mount Sinai Hospital, New York
Lucy Horton, Internal Medicine
St. Luke’s/Roosevelt Hospital, New York
Sumeet Jain, General Surgery
SUNY Upstate Medical University Program, Syracuse
Logan Jerger, Pediatrics
Albert Einstein College of Medicine-Montefiore Medical Center, Bronx
Tania Kupferman, Internal Medicine
Albert Einstein College of Medicine-Montefiore Medical Center, Bronx
Ellie Kwak, Diagnostic Radiology
New York Presbyterian Hospital-Columbia, New York
Christina Lu, Emergency Medicine
SUNY-Stony Brook
Leo Menashe, Diagnostic Radiology
Mount Sinai Hospital, New York
Medicine Prelim., Steward Carney Hospital, Boston
Roger Moon, Anesthesiology
SUNY-Stony Brook
Adin Nelson, Pediatrics
Albert Einstein College of Medicine-Jacobi Medical Center, Bronx
Susan Philipose, Emergency Medicine
North Shore-LIJ, Manhasset
Khurram Rasheed, Vascular Surgery
University of Rochester-Strong Memorial Hospital, Rochester
Jane Rosen, Internal Medicine
Lenox Hill Hospital, New York
Eugene Schiff, Family Medicine
Albert Einstein College of Medicine-Montefiore Medical Center, Bronx
Christina Sefert, Orthopedic Surgery
NY Medical College/Westchester Medical Center, Valhalla
Caitlin Snyder, General Surgery
Albany Medical Center, Albany
David Solomon, Diagnostic Radiology
Albert Einstein College of Medicine-Jacobi Medical Center, Bronx
Transitional, Lemuil Shattuck Hospital, Boston
Paul Strombom, General Surgery
Albert Einstein College of Medicine at Beth Israel Medical Center, New York
Jenny Uekana, Internal Medicine
New York University Medical Center, New York
David Weiss, Family Medicine
New York Presbyterian Hospital-Columbia, New York
Michael Winter, Medicine/Pediatrics
University of Rochester-Strong Memorial Hospital, Rochester
Rachel Wozniak, Ophthalmology
University of Rochester-Flaum Eye Institute, Rochester

Elizabeth Baltar, Family Medicine
University of North Carolina Hospitals Program, Chapel Hill
Lauren Fedore, Otolaryngology
University of North Carolina Hospitals Program, Chapel Hill
Rachel Knox, Family Medicine
Carolinas Medical Center Program, Charlotte
Eric MacEvoy, Family Medicine
Wake Forest University Baptist Medical Center, Winston-Salem

Crístin O’Grady, Family Medicine
Mountain Area Health Education Center Rural Program, Hendersonville
David Peritz, Medicine/Pediatrics
University of North Carolina Hospitals Program, Chapel Hill
Steven Poon, Family Medicine
Wake Forest University Baptist Medical Center, Winston-Salem
McAllister Windsor, Pediatrics
Duke University Medical Center, Durham

Caroline Hesko, Pediatrics
Case Western Reserve University/University Hospitals, Cleveland
Nupur Jhawar, Internal Medicine
Case Western Reserve University/University Hospitals, Cleveland
Meredith Posner, Pediatrics
Cincinnati Children’s Hospital/University of Cincinnati Program, Cincinnati
Ashley Sekhon, Radiation Oncology
Ohio State University Medical Center, Columbus
Medicine Prelim., Case Western Reserve University/University Hospitals, Cleveland
Sohrab Visk, Orthopedic Surgery
Ohio State University Medical Center, Columbus

Jessica Knox, Family Medicine
Providence Milwaukie Hospital Program, Milwaukee

Lawrence Cetrulo, General Surgery
Albert Einstein Medical Center, Philadelphia
Erica Coffin, Anesthesiology
University of Pittsburgh Medical Center Program, Pittsburgh
Medicine Prelim., Roger Williams Medical Center Program, Providence, R.I.
Gregory Halenda, Anesthesiology
University of Pittsburgh Medical Center Program, Pittsburgh

Elizabeth Samuels, Psychiatry/Child Psychiatry
Hospital, Providence
Brown University Program-Rhode Island Hospital, Providence

Adam Janicki, Emergency Medicine
Brown University Program-Rhode Island Hospital, Providence
Christina Pastorello, Pediatrics/Psychiatry/Child Psychiatry
Brown University Program-Rhode Island Hospital, Providence
Elizabeth Samuels, Emergency Medicine
Brown University Program-Rhode Island Hospital, Providence
Mark Turschen, Family Medicine
Brown University Program-Memorial Hospital, Pawtucket
Liza Valdivia, Internal Medicine
Brown University Program-Rhode Island Hospital, Providence

Christy Guth, General Surgery
Vanderbilt University Program, Nashville

David Truong, Ophthalmology
University of Texas Southwestern Medical School Program, Dallas
Medicine Prelim., Steward Carney Hospital, Boston
Amy Vyas, Psychiatry
Baylor College of Medicine Program, Houston

Aaron Glenney, Family Medicine
University of Vermont Program, Burlington
Julien Wonderlick, Diagnostic Radiology
University of Vermont Program, Burlington
Surgery Prelim., University of Vermont Program, Burlington

Thomas Bennett, General Surgery
Naval Medical Center, Portsmouth
John Kelly, Pediatrics
University of Virginia Program, Charlottesville

Robert Bonow, Neurological Surgery
University of Washington Program, Seattle
Patrick Burns, Emergency Medicine
University of Washington Program, Seattle
Tobias Chapman, Radiation Oncology
University of Washington Program, Seattle
Medicine Prelim., Steward Carney Hospital, Boston
Michael Cronin, Pediatrics
University of Washington Program, Seattle
Allison Moyes, Emergency Medicine
University of Washington Program, Seattle

Neel Shah, Orthopedic Surgery
Madigan Army Medical Center, Tacoma
Rebecca Stuwart, Pediatrics
University of Washington Program, Seattle
Michelle Starr, Pediatrics
University of Washington Program, Seattle
Todd Yezefski, Internal Medicine
University of Washington Program, Seattle
Their rallying cry: “Let’s make it a million!”

By the time they gather for their 55th reunion in spring 2013, members of the School of Medicine’s Class of 1958 hope the scholarship fund that bears their name will have reached a cool seven figures, extending the fund’s reach and potential impact.

“That’s what we’re anticipating and hoping for,” says William McDermott, A53, G54, M58, A84P, of Falmouth, Mass., who was instrumental in creating the M58 Scholarship Fund and now, with a Cape Cod classmate, is leading a drive to bolster it.

His 55th reunion committee cochair, Philip Sullivan, ’58, of Monument Beach, Mass., notes, “Tufts gave an awful lot to the class—to every class. With the high cost of medical education today, it’s a way of paying back and helping someone else pursue a life in medicine.”

The fund-raising effort has about $170,000 to go, McDermott says. “We’re trying to come up with some innovative ways to raise the money,” he adds, including encouraging classmates to put a charitable bequest, charitable gift annuity or other planned gift in place to add to the M58 Scholarship Fund.

“The need for scholarship support is incredible,” McDermott says. “It cost $1,000 a year when I went to medical school. A hard-working kid could make

Lightening the Load

Members of the Class of 1958 pitch in to help students defray the high cost of a medical education by Mark Sullivan
that in a summer.” Today, he says, a typical student can leave medical school with a debt of $200,000 or more.

So classmates who began their medical careers together more than a half-century ago are doing what they can to aid a new generation of Tufts doctors. The current holder of the M58 Scholarship, Dan Corrigan, ’13, grew up on Massachusetts’s South Shore in Hanover, Mass. He pursued an interest in research as an undergraduate at Stonehill College and then at Tufts, where he earned a master’s degree in biomedical science.

Then he did a stint in the emergency room at Mass. General the summer between his first and second years of medical school. Cases he saw in the ER included a heart attack, a stroke, stabbings, a pedestrian hit by a car and combatants needing stitches after a bar fight. He since has decided to focus on emergency medicine. “I like the fast pace,” Corrigan says. “I’m kind of an adrenaline junkie.”

Emergency medicine, he notes, is not among the most lucrative fields. Receiving the M58 Scholarship, which covers one-quarter of a year’s tuition, has enabled him to consider a career in ER medicine because of the reduced debt he will carry after graduation. “Medical school is crazily expensive right now,” he says. “Accruing this debt is very daunting, and having support lightens the load.”

The message he’d give his M58 benefactors: “I would like to thank them for their generosity and let them know how much it helped to put debt away, in the back of my mind. The scholarship has helped me make a decision on what type of medicine I want to practice, without debt as my main focus.”

PAYING IT FORWARD
In a recent letter to their classmates, Sullivan and McDermott noted that the class had raised more than $500,000 at its 50th reunion to establish the endowed scholarship. “We all left our reunion with a wonderful sense of satisfaction from working together to do something essential to help today’s students afford the medical education that we received and still treasure,” they wrote.

“The generous efforts of our classmates and friends over the past several years have continued to increase the value of our fund to over $830,000. That’s why we are saying, ‘Let’s make it a million.’ We know that won’t be easy. We are sensitive to the significant financial hazards and impact of the past several years. But if we work together, we can do it,” they wrote.

“We look forward to our 55th reunion in April 2013, [when] we will stand up, let out a cheer, and say, ‘Look what we have done. We made it a million!’”

Both reunion cochairs see the fundraising effort as a meaningful, targeted and appropriate way to repay the medical school for the top-notch training they received as students. Sullivan, an obstetrician and gynecologist and a former long-time member of the clinical faculty at the School of Medicine, says he is grateful for the “superb” education he received at Tufts. McDermott agrees. A retired rear admiral in the U.S. Navy, he is the former head of the Naval Medical Command, which provided health care to more than two million Navy and Marine personnel and their families around the world. His naval career took him to Vietnam, the Philippines, Indonesia, nearly every country in South America and to Europe.

His Tufts experience paved the way, he says. “I feel honored to have been an undergrad and at medical school at Tufts,” McDermott says. “You made friendships that lasted forever.”

Mark Sullivan, a writer and editor in Advancement Communications at Tufts, can be reached at mark.sullivan@tufts.edu.
Making her mark on the world

Susan Philipose, M12, knows that you don’t choose who comes through the door in an emergency room. Often, patients don’t have financial or societal support, and many are mentally ill. These are the people with whom Susan wants to work—the people who have nowhere else to turn.

YOUR GIFT SUPPORTS
students like Susan, for whom financial aid made all the difference between an unfulfilled dream of helping others... and embarking on a lifetime of healing.

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Our Evolving School

This is my last column as president of your Tufts Medical Alumni Association. It’s been a pleasure to serve the association, and I welcome my successor, Laurence Bailen, ‘93, as the newly elected president. Laurence has been involved with the association for a number of years and teaches in the gastroenterology track at the medical school, where he serves as an assistant professor. It is a pleasure to pass over the reins of alumni leadership to someone as distinguished and capable as Laurence.

This year has been an exciting one for your medical school and for Tufts University. One of my responsibilities during this time was to accompany President Anthony P. Monaco as he met with alumni all over the country. This was an overwhelmingly positive experience. You and I are fortunate to have as our president an accomplished scientist who understands the importance of a medical school education and both clinical and basic research.

One of President Monaco’s immediate goals has been to encourage greater collaboration among our schools. For example, Tufts Medical Center will soon be applying to the National Institutes of Health to be a designated cancer center. In addition to the medical center, the strengths of our program lie in its unusually wide range of connections among a number of the pillars of our educational enterprise: the Schools of Medicine and Dental Medicine, the Friedman School of Nutrition Science and Policy and the Jean Mayer USDA Human Nutrition Research Center on Aging on Tufts’ health sciences campus in Boston; the Cummings School of Veterinary Medicine on the Grafton campus and the Department of Biology in the School of Arts and Sciences on the Medford/Somerville campus.

There are many other examples on our campuses of such fruitful interactions that tap our underlying strength. Recently the medical school’s board of advisors heard from Professor David Walt, a distinguished researcher in Tufts’ chemistry department, about his research collaborations with faculty members at the medical school. Interdisciplinary science holds great promise for our school in the days and years ahead.

Again, it has been my pleasure to serve the Alumni Association as I look forward to my 50th reunion next year. Thank you for the opportunity.

David S. Rosenthal, ’63
President, Tufts Medical Alumni Association
david.rosenthal@tufts.edu

Class Notes

62 Charles Block of Lewis Center, Ohio, has been an associate clinical professor of pediatrics and family practice at the Ohio State University Medical Center and chief of staff at the VA Outpatient Clinic, both in Columbus. During his free time these days, Block works with Habitat for Humanity, gardens, travels and cheers for the OSU Buckeyes. He and his wife, Constance, have four children and nine grandchildren.

Lawrence Bohan of Oxford, Md., has fond medical school memories of faculty member Benjamin Spector discussing cadaver dissection and conveying his respect for the human body, nearly 50 years ago. Bohan served as head of the nephrology branch at the National Naval Medical Center from 1975 to 1983 and now divides his time (with his wife, Joyce) between Vero Beach, Fla., and his home in Maryland.

Alan Diamond of Salem, Mass., is proud that he was never sued for surgical malpractice in all his years in medicine. He was a general surgeon based in Lynn, Mass., and reports that he is enjoying his life in retirement.

David Kudzma of Vero Beach, Fla., can’t shake the memory of skipping a clerkship in September 1960 to watch his boyhood hero Ted Williams take his final swing at Fenway Park. “Ended up seated about 20 feet away from the spot where his last at-bat (ever) landed in the right-field bleachers,” he writes. A young John Updike was there to memorialize the game in “Hub Fans Bid Kid Adieu,” his timeless feature for The New Yorker.

Kudzma, an internal medicine specialist, later taught at the Einstein College of Medicine and the University of Miami. He now raises orchids and sips cocktails in his spare time. He advises current students to “be tirelessly medically meticulous: e.g., omit or disregard the past or social history at your peril and never, never listen to the chest through the patient’s clothes!”

Frances L. Nenna of Yarmouth Port, Mass., one of four women in her class, says she enjoyed being treated “like one of the guys and going to lunch at the Athens restaurant.”
She was a pediatrician on Cape Cod for many years, and now spends time visiting her children, dancing, reading and learning to play the guitar.

**John Robinson** of Milton, Mass., has been a pediatrician affiliated with hospitals including MGH, Brigham and Women’s, Beth Israel, Children’s and Milton Hospital. Pressed to cite honors he has received in his career, Robinson answers modestly, “Only the honors of seeing my patients.” He and his wife, June, have four children and 11 grandchildren.

**Jack Alpert** of Houston, Texas, writes that he continues to teach at the University of Texas and works fulltime “except nights and weekends.” He recently completed a book titled *The Neurological Diagnosis: A Practical Bedside Approach* (Springer).

**Kim Bowman, J74**, of Lexington, Mass., has been honored as the 2012 Community Clinician of the Year by her physician peers of the Norfolk District Medical Society. Board certified in internal and geriatric medicine, Bowman is a community physician in Brookline, affiliated with Beth Israel Deaconess Medical Center in Boston. A member of the Massachusetts Medical Society since 1986, she has been a member of the society’s House of Delegates since 2003. She also served as a member of the Committee on Women in Organized Medicine from 1994 to 1998.

**Kathleen Brown** of Los Angeles, Calif., was inducted as a fellow in the American College of Radiology, one of the highest honors the ACR can bestow, at the organization’s annual meeting in April in Washington, D.C. Brown is a professor of clinical radiology at the David Geffen School of Medicine at UCLA.

**Suzanne Salamon** of Brookline Mass., head of the Brookline Medical Reserve Corps and a volunteer for the Brookline Council on Aging, is the recipient of the 2011 Public Health Leadership Award given by the Friends of Brookline Public Health. A leader in the field of geriatric medicine, she completed a fellowship in geriatric medicine at Harvard Medical School. She served as the director of geriatrics at the Lemuel Shattuck Hospital in Jamaica Plain for 19 years. Noted for her expertise in working with challenging geriatric patients, she also received that hospital’s Excellence in Teaching Award in 2000. Salamon has been associate chief for clinical programs at Beth Israel Deaconess Medical Center since 2004.

**Kitt Shaffer** of Cambridge, Mass., was inducted as a fellow in the American College of Radiology at the ACR annual meeting in April in Washington, D.C. Shaffer is a professor of radiology at Boston University School of Medicine, vice chair of radiology at Boston Medical Center and a radiology education consultant at Brigham and Women’s Hospital.

**Robert Harrington** of Morrisville, N.C., will join Stanford University School of Medicine in July as chair of the Department of Medicine. He currently directs the Duke Clinical Research Institute in North Carolina, the largest clinical trial research organization in the world. He came to Duke as a cardiology fellow in 1990 and has served on the faculty since 1993, most recently as the Richard S. Stack Distinguished Professor in Cardiology. The Stanford Department of Medicine comprises 220 faculty members in 14 divisions. Harrington sees his new job as “[creating] a team within the department of medicine that’s bigger than the individual pieces.”

**Kathy Mahoney, J81**, of Longmeadow, Mass., is now a fellow in the Department of Healthcare Quality at Baystate Medical Center in Springfield. She notes that this position represents her third Tufts-linked educational experience. Mahoney writes that she has “taken leave from her clinical practice and left private practice ownership to follow her dream of improving health-care delivery for all.” She and her husband, Frank, are enjoying their newfound flexibility to spend more time at their new home in Ludlow, Vt., among other diversions.

**Karl Hekimian** of Tucson, Ariz., counts Ernest Grable at Newton-Wellesley Hospital as a faculty member who influenced him deeply during his student days. Hekimian is a plastic surgeon in Tucson, where he has served as chair of the Department of Surgery at Carondelet St. Mary’s Hospital and a member of that hospital’s board of directors. He and his wife, Diane, have two children, Larissa, 28, and Julia, 11.

**Francine Hennessy** of Bedford, Mass., a pediatrician who specializes in adolescent medicine, says she “loves being a small-town M.D.” She maintains her medical office in the same community west of Boston where she lives. “On a daily basis the knowledge and skills acquired at Tufts Medical School allow me to provide excellent, comprehensive care to adolescents with complex needs. My greatest accomplishment is taking care of a second generation of patients.”

**Stan Wasilewski** of Westfield, N.J., a cardiologist, writes that he first tried downhill skiing during his first year of medical school. “Skiing has become a lifelong passion for myself and my family since then,” he writes, including many ski trips to Utah and Vermont over the years. He and his wife, Bettina, have two children, Julia, 18, and Max, 13.

**Lynn Fordham** of Chapel Hill, N.C., was inducted as a fellow in the American College of Radiology at the organization’s annual meeting in April.
in Washington, D.C. She is chief of the division of pediatric radiology at North Carolina Children’s Hospital in Chapel Hill and an associate professor of radiology at the University of North Carolina School of Medicine.

Maryellen Gilfeather of Salt Lake City, Utah, was also induct-ed as a fellow in the American College of Radiology in April. Gilfeather is a partner-associate at Utah Imaging Associates (in Bountiful, Utah) and an adjunct associate professor of radiology at the University of Utah Health Sciences Center.

Edwin Huang of Boston, Mass., an assistant professor of obstetrics, gynecology and reproductive biology at Harvard Medical School, has been named chair of obstet-rics and gynecology at Mount Auburn Hospital in Cambridge. He was previously affiliated with Massachusetts General Hospital, where he had been since 2000 and where he served as associate director of the ob/gyn residency program shared between MGH and Brigham and Women’s Hospital. Huang’s clinical expertise includes gyneco-logical procedures and minimally invasive surgery.

Lee Rubin of Providence, R.I., has been appointed an assistant professor of orthopedic surgery at the Warren Alpert School of Medicine at Brown University. His practice focuses on hip and knee replacement, with clinical interests in direct anterior hip surgery and minimally invasive techniques. In addition to his responsibilities at Brown, Rubin is helping to develop a “Total Joint Center of Excellence” at Miriam Hospital in Providence. He and his wife, Jamie, have two children, Abigail, 3, and Matthew, 1.

In Memoriam

Theodore Rosen, A30, M33, of Manchester, Conn., died on February 1, 2012. Rosen, a GP who was beloved in the Connecticut River Valley, was profiled in our last issue (“Home Town Doc,” Winter 2012). He was 103 years old.

Edward Emerson Hodsdon, ‘40, of Charlotte, N.C., died on January 5, 2012. He was an ophthalmologist at Coral Gables (Fla.) Medical Center for 31 years and a founding member of Doctors Hospital in Coral Gables.

Raymond Yesner, ‘41, of Woodbridge, Conn., who taught pathology at Yale School of Medicine for many years and served as associate dean of the school from 1968 to 1974, died on February 8, 2012, at age 97. He was recognized around the world as an expert in lung cancer.


Philp Wade, ‘52, of Quaker Hill, Conn., died on January 22, 2012. He was a retired head of Thoracic and Vascular Surgery at Lawrence & Memorial Hospital in New London, Conn.

Robert Haley, ‘53, of South Dartmouth, Mass., died on May 4, 2012, at age 85. He was a physician for 50 years who served in the U.S. Navy during World War II, loved music and founded the Bob Haley Orchestra.

James Whelton, ‘53, of Wayland, Mass., died on May 12, 2012. He was chair of the Department of Obstetrics and Gynecology at St. Elizabeth’s Medical Center for 25 years and a professor at the medical school.


Frederic Kwapien, ‘54, of Media, Pa., a psychiatrist whose career was based in Philadelphia and who specialized in treating adolescent depression, died on April 17, 2012.

James Grassi, A51, M55, of Winchester, Mass., died on April 8, 2012, at age 83. He was a patholo-gist at Choate Memorial Hospital in Woburn, Mass., for many years, including a term as chief of pathology and director of laboratories there.


Henry Izeman, ‘58, of Bristol, R.I., died on January 6, 2012, at age 79. He was one of the first board-certified geriatricians in Rhode Island and taught at Brown Alpert Medical School.

Melvin Abend, ‘64, of Atlanta, Ga., a general surgeon, died on December 19, 2011. He had a 39-year career working at several hospitals in the Atlanta area.

Joel Lubin, ‘96, of Davis, Calif., an orthopedic surgeon, died on March 31, 2012, at age 42.

Editor’s Note: There was an error in the In Memoriam listings in the Winter 2012 issue. John E. Doherty, ‘53, of Walpole, Mass., died on August 30, 2011. We apologize for the error.
Sprinting on Our Behalf

Our quadrennial celebration of idealized human form and physiology discomforts me like a tight pair of slacks. Do the Olympics end up ranking people, or their bodies?

Every week I welcome a new wave of injured, impaired and even unconscious people into the brain injury rehabilitation unit at New England Rehabilitation Hospital. For every one of my patients, life has just gotten a lot messier. Some will work with us a few weeks and graduate—and I will never see them again. Other survivors will learn that life’s challenges require ceaseless adaptation. These are the cases I continue to work on in my clinic, and they are some of the most rewarding. Recovery takes as many paths as there are ways through life.

I’m a physical medicine and rehabilitation physician. In the daily work of my field we use cumbersome orthotics riddled with Velcro straps to help paralyzed people walk, and we use prosthetics that damage skin and cause arthritis to replace missing limbs. We’ll silence muscles gone haywire with injections of neurotoxin. We depend on rote practice and prisms to bend the world into view when patients lose part of their visual field. The high-tech tools we have require plenty of elbow grease.

My job is messy by its nature. This is why I’m celebrating that the 2012 Summer Olympics in London are poised to sweep the world straight from saccharine choreography into the complexity of the human condition, the reality of imperfection my patients and I face down daily. I base my hopes on the International Olympic Committee’s agreement to allow a 25-year-old South African, Oscar Pistorius, to compete in the 400-meter dash at the Summer Games if his times qualify him. Pistorius, a double below-the-knee amputee who’s been dubbed the “blade-runner” for his carbon-fiber running prostheses, has to sprint just once more under 45.30 seconds to qualify at the time of this writing.

The idea that a disabled athlete is on his way to the Olympics has drawn widespread criticism, with some singling out the “unfair advantage” they believe Pistorius stands to gain from his artificial legs. He relies on carbon-fiber prosthetic technology common in many orthotics and prosthetics. The material can store and release some of the kinetic energy you put into it, but it’s only a pale imitation of the superior energy return capacity that muscles and tendons provide. From the vantage point of a doctor who’s spent time working with amputees on all the complications that occur when we meld flesh with plastic and metal, it’s surreal to hear anybody claim Pistorius might have a technological edge.

There’s no question that Pistorius runs differently and that his success in the 400 meters wouldn’t be possible without technology developed in the last 15 years. Standing on his blades, Oscar Pistorius forces us to accept the imperfections in ourselves and each other. He’s a bright and shining reminder that all athletes are physically unique in ways that profoundly impact their performance in sport. Every seemingly unadulterated athlete has unique biomechanics, thanks to variations in limb length, bone density, tendon lubrication and joint range of motion. Long hours of hard training powered by an indomitable spirit will indeed speed the rate your muscles clear lactic acid and get oxygen, but a genetic lottery has already set you on an unequal training ground.

For years, the Paralympics, where Pistorius is a champion, have practiced the imperfect science of classifying athletes by varying levels of disability. But by breaking into the Olympic Games with his world-class times, Pistorius is upending the entire concept of disability, its classification and its containment.

Despite our living in times in which many of Pistorius’s competitors can credit their own lives and health to medical technologies like bronchodilators, antibiotics and orthopedic surgeries, and despite an uneasy suspicion that winning edges often boil down to epigenetic predispositions, only when this young man fits on his carbon-fiber legs and strides to his starting point in the London Olympic Stadium will we all get up to speed. The normal range of human variation must allow for our repair and adaptation.

This summer we’ll share a transformational moment for rehabilitation, and for humanity, because whoever’s in the race with Oscar, we’re all chasing with him a life unlimited by our physical imperfections.

The author is an assistant clinical professor in the Department of Physical Medicine and Rehabilitation at Tufts University School of Medicine, the medical director of brain injury rehabilitation at New England Rehabilitation Hospital and a medical correspondent for The Atlantic.
Michael, M64, A87P, A92P, and Deborah Gilman, M64, A87P, A92P, arrived at TUSM in 1960 with a piece of information they preferred to keep under wraps: they were newlyweds. “I took my engagement ring off for my interview,” says Debbie. “In those days, a woman might not have gotten into medical school if she were engaged.”

The Gilmans studied together at Tufts, then did their residencies at Yale, Debbie in psychiatry and Mike in ophthalmology. After moving to Seattle and then D.C., they eventually settled in Springfield, Massachusetts, with their four children. Today they live in Phoenix, where Mike is a docent and president of Volunteers in the Garden at the Desert Botanical Garden and Debbie is involved with the Volunteer Nonprofit Service Association’s annual book sale.

Mike and Debbie have included a charitable bequest for the medical school in their wills. “Tufts gave us a unique chance to go to medical school together,” says Mike. “We wanted to say thank you.”

Tufts

For more information please contact Tufts’ Gift Planning Office
888.748.8387 giftplanning@tufts.edu www.tufts.edu/giftplanning
Evan Barnathan, A08, M14, has always loved music, so last fall he got the bright idea to launch an a cappella singing group for students at the Josiah Quincy School near the medical campus. To learn how that worked out, see our story on page 6.