

BROWN MEDICINE

Volume 20 | Number 1 | Winter 2014

PLUS:

PLME

DAWN

Page 32

CARVER

M.E.

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Toe to Toe

How do we
decide when
to save a limb
and when to
let it go?

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LETTER

FROM THE DEAN



Defining Moments

One of the hallmark features of Alpert Medical School is the Program in Liberal Medical Education. A number of medical schools have such undergraduate-plus-medical school programs, each with its own institutional take on it. In this issue of *Brown Medicine*, we travel back 30 years to 1984, when the Brown Corporation first approved a lively experiment that held physicians should be “broadly and liberally educated.”

It's safe to say now the experiment has been a success, when we look at how its alumni have done, and its ideals have caught on in medical education. Beginning next year, the MCAT—the exam applicants to medical school take—will add a social and behavioral sciences section, as well as a Critical Analysis and Reasoning Skills section, reflecting “the fact that medical schools want well-rounded applicants,” according to the Association of American Medical Colleges’ website.

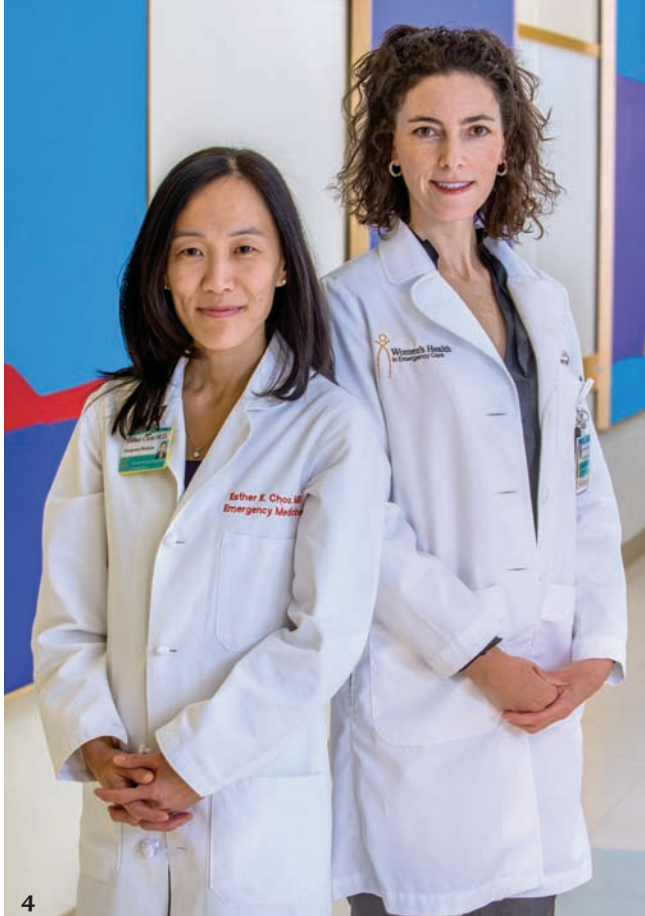
In between issues of the magazine, you can stay in touch with happenings in the Division of Biology and Medicine by reading my Kudos! newsletter online (brown.edu/go/kudos). Every month we share the accomplishments of faculty, staff, and students. There is much to be proud of here.

I hope you enjoy this issue of *Brown Medicine*.

Sincerely,

A handwritten signature in black ink that reads "Jack A. Elias M.D." The signature is written in a cursive, flowing style.

Jack A. Elias, MD



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“The focus on promotion of health rather than treatment of illness—that’s where medicine should be going.” —Robert Klein, MD Page 18

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COVER
STORY

Navigating the Gray Zone

BY BETH SCHWARTZAPFEL

Imagine your leg is gravely injured. You’re given a choice: amputate it and get a high-tech prosthetic, or undergo years of surgery and rehab to save it. How do you decide?

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The Whole Physician

BY PHOEBE HALL

Thirty years ago, they signed on to one of Brown’s grand educational movements. Meet some of the first students admitted to the Program in Liberal Medical Education.

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Body of Evidence

BY SARAH BALDWIN-BENEICH

Wayne Carver is the doctor you never want to need. All his patients die, but there’s healing in helping them find justice.

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Brain power.	

Cover: Heather Abbott photographed at First Beach, Newport, by Jesse Burke.

Life According to Brown

Some of my colleagues and I have been assessing our communications efforts on Brown's behalf. What are we telling the world about Brown, and is it true? Our first exercise in this gut-check was to sort through a pile of about 100 picture postcards to select the image we each thought best symbolized Brown. Our choices were not entirely surprising: a stand of deep-rooted redwoods; a bronze mask; diversely colored kites flying freely in a blue sky.

But ideas and symbols mean nothing if there are not people who embody them. People like the ones we meet in this issue. They are people who would trust their education and careers to partake in a bold educational experiment. A doctor who faces the darkest side of humanity to bring his patients justice. They are surgeons who practice an uncertain art and yet accept all the risk. They are the courageous, creative thinkers we talk about when we talk about Brown.

In the last issue, we told you about a brave alumna, Leslie Gordon, who received the inaugural Early Achiever Award for her research on the early aging disease progeria—a quest she began when her son, Sam, was diagnosed with it. Sam passed away from complications of progeria on January 10. If you haven't already, make it a point to see *Life According to Sam*, an HBO documentary about Sam and his family.

Sam very badly wanted to attend Brown, and I'm sad he won't have the chance. He would've fit right in.



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MEDICINE

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INBOX

CORRECTIONS

Two alums were misidentified in the Fall 2013 issue: Shoma Brahmanandam '99 MD'03, in a photo on the bottom left of page 48; and Andrew Crawford '07 MD '13 (also shown at right) in the top photo on page 49. *Brown Medicine* regrets the errors.



APPLAUSE, APPLAUSE

We live for the applause! *Brown Medicine* magazine won the Gold for Best Writing in the print magazine category from the Council for the Advancement and Support of Education (CASE) District 1 Excellence Awards. The magazine won the Bronze for Best Overall Magazine.

Phoebe Hall's article "Pop Culture" in the Spring 2013 issue earned an Honorable Mention in the Robert G. Fenley Writing Awards General Staff Writing category of the Association of American Medical Colleges' Awards for Excellence competition.

Behind the Scenes

During a photo shoot in the lobby of Sidney Frank Hall in November, staff writer Phoebe Hall (left), Kermit the Frog, and BioMed research engineer John Murphy pass the time singing "Caribbean Amphibian" and sharing fly-catching tips. Turn to page 10 to read more about the talking puppet and Murphy's other creations.



SCOTT KINGSLEY; ADAM MASTOON

COMING SOON

March 7, 2014: 250th Anniversary Opening Celebration and Mini Med School 250.brown.edu

March 21, 2014: Match Day
brown.edu/go/match-day

May 23-25, 2014: Commencement-Reunion Weekend
brown.edu/go/md-reunion 

WHAT DO YOU THINK?

Please send letters, which may be edited for length and clarity, to:

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The

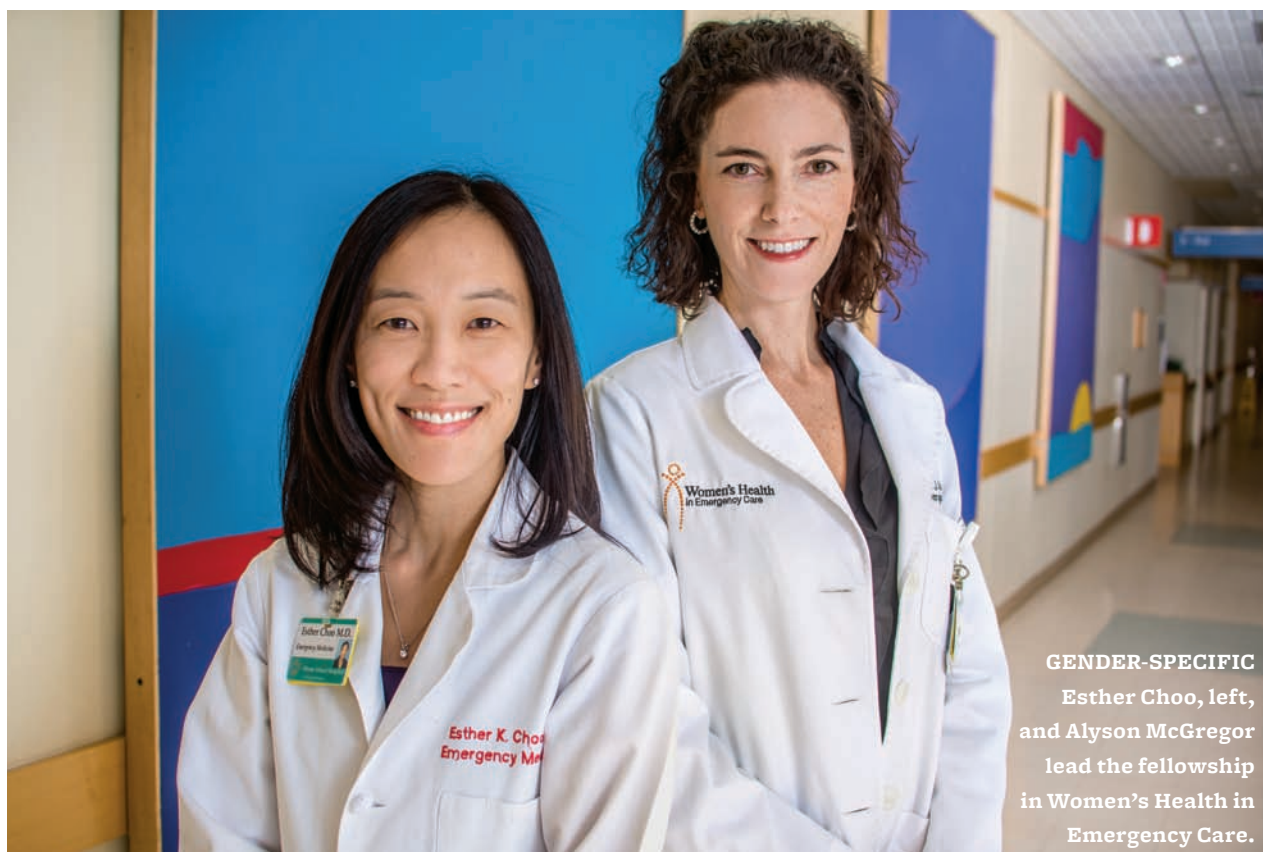
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WHAT'S NEW IN THE CLASSROOMS, ON THE WARDS, AND IN THE LABS



GENDER-SPECIFIC
Esther Choo, left,
and Alyson McGregor
lead the fellowship
in Women's Health in
Emergency Care.

ELEVATOR PITCH

It's Not the Same

A new program brings gender-specific medicine to the ED.

Recognizing the need for gender-specific research and education in emergency medicine, Alyson J. McGregor, MD, and Esther K. Choo, MD, MPH—both assistant professors of emergency medicine at Alpert Medical School—co-founded the Division of Women's Health in Emergency Care (WHEC) in 2011. WHEC, which runs a two-year fellowship, is the first program of its kind in the country.

Brown Medicine spoke to McGregor, WHEC director, and Choo, WHEC associate director, about their innovative initiative.

First, a definition: What is “women’s health”?

Originally, the notion of “women’s health” was synonymous with reproductive issues: childbearing, breast health, and menopause. But the concept has evolved over the past decade, and now refers to complex interactions between biology, behavior, and the environment. We are developing a deeper scientific understanding of sex and gender differences in the etiology, diagnosis, progression, outcomes, treatment, and prevention of many conditions that affect both women and men.

DAVID DELPOIO

Why is it so critical to recognize gender differences in medicine, particularly in the emergency setting?

We are starting to pay the consequences of ignoring sex and gender in medical research, with inappropriate drug dosages and improper treatment approaches to diseases that are very different between males and females. The Institute of Medicine and the National Institutes of Health have drawn attention to the need for creating a sex and gender focus in medicine. At the same time, there are more people utilizing the emergency department as a primary point of contact for health care than ever before. Because both disease processes and responses to treatment play out before our eyes in the emergency department, emergency physicians are uniquely positioned to translate this new focus into lifesaving outcomes.

What are the goals of WHEC?

Our goals are to study and advance sex- and gender-specific medicine and women's health as it relates to the practice of emergency medicine. We have an educa-

“We want to contribute to science and create the next generation of women’s health researchers.”

tional program that includes rotations for medical students and residents and a two-year research training fellowship. We also conduct our own research on sex and gender differences in acute conditions. We want to contribute to science and create the next generation of women's health researchers. These will be our lasting contributions to medicine. We are lucky to have a great team of collaborators from across the Brown community who support us in these goals.

What drove you to establish WHEC in the first place?

Choo: I've been doing research on interventions for substance abuse in women in the emergency department (supported by NIDA). As I started this work, the first thing I learned was that everything was different for women: why they start using alcohol and other drugs, what motivates them to change, what

barriers they face to making change. That opened my eyes to how critical it is to consider gender every time we approach a patient; the failure to do this in medicine represents a huge health disparity. Then I sat down next to Alyson at a faculty meeting, and the rest is history.

McGregor: My interest in medicine has long encompassed the women's perspective. As a female physician, I understand both the challenges women face in choosing this type of career as well as the nuances of caring for female patients. During my residency, I came upon a book called *Principles of Gender-Specific Medicine* by Marianne Legato. It underscored for me a concept I had recognized: that women are different from men in every cell of our bodies, and that medicine was not yet taking this difference into account. I have been passionate about changing the model of medicine to include sex and gender—and bringing this concept to my specialty—ever since.

OVERHEARD

“I believe that we have about 20 years before the medical and economic costs of this disease, let alone the social costs, just cripple our entire medical system.”

—**PETER SNYDER, PHD**, professor of neurology and vice president for research at Lifespan, speaking about Alzheimer's disease in a December 19, 2013, story on Forbes.com. Researchers are now focusing on the disease's earlier stages in hopes of finding therapies that slow its progression.

What are your hopes for the program's growth at Alpert Medical School and beyond?

We are just scratching the surface in the field of sex and gender research in acute care; the new division is only the beginning. We are working to advance our research and educational endeavors. For example, we recently launched an education program for both our patient care providers and patients focused on gender in medicine. We also hope to increase our community outreach to make sure our academic pursuits have a real public health impact. Once we establish a strong foundation for our division, we can support other departments of emergency medicine across the country in creating similar programs.

—**Kylah Goodfellow Klinge**

HOSPITAL



Thanks for Sharing

See your doctor with your clothes on.

Many patients, when facing a life-changing diagnosis, find comfort in knowing they're not alone in their struggle. Now some of them aren't alone in their doctor's office, either.

A shared medical appointment, or SMA, allows a physician and other providers to see multiple patients dealing with similar health issues at one hour-and-a-half session. It has the feel of a support group, and that peer encouragement and motivation, combined with professional medical advice, seem to make a difference.

"Ninety minutes may sound like too much time to some, but regular one-on-one visits aren't yielding results," says Iris Tong, MD, FACP RES'01, director of women's primary care at the Women's



STRONGER TOGETHER

(Top) Iris Tong, center, talks with patients in a shared medical appointment. (Above) Patients get one-on-one time too.

thing will click for a patient in a group. They learn from each other."

SMA's are a relatively new concept, developed by a Colorado geriatrician in 1991, and their effectiveness hasn't been broadly studied. But research points to greater satisfaction for both physicians and patients as well as similar or moder-

cal dietitian Katie Lester, RD, LDN. Pierannunzi says fellow patients as well as her providers are helping her make healthier lifestyle choices. "You learn from other people's situations. You hear their obstacles and what they're doing to alleviate them," she says.

The pre-diabetes sessions take place monthly in a group room at the Women's Medicine Collaborative. A semicircle of chairs faces a whiteboard, which lists each patient's first name alongside data such as weight change, blood sugar, amount of physical activity, and fruit and vegetable intake. A medical assistant at the back of the room privately takes patients' vitals and provides any necessary tests or immunizations.

"When you see your test results on the board, it does have that effect of being held accountable," Pierannunzi says. But not in a bad way. "Dr. Tong creates a very supportive, encouraging environment—not punitive," she says.

Tong, who keeps the sessions informal and even jokes with the group about her own dietary missteps, says SMA's offer tangible benefits in addition to emotional support. "Patients get a whole team for one co-pay, plus a longer time with us," she says. They continue to see Tong individually, too; though all participants sign a confidentiality agreement before each group meeting, they discuss highly personal or sensitive information privately.

Margaret Miller, MD, FACP RES'95, director of the Women's Medicine Collaborative, wrote the clinical program grant to develop the SMA's, which launched in 2012. She's now hoping to get a research grant to assess their effectiveness. The anecdotal evidence is in, however.

"It's fun for patients, it's fun for providers," Miller says. "We talk about challenges and brainstorm strategies to improve health and well being. You feel you're doing more of what you really want to do—what you went into medicine for."

—Phoebe Hall

"Dr. Tong creates a very supportive, encouraging environment."

Medicine Collaborative in Providence, which offers SMA's for several health issues. "During the SMA, the provider has time to address individual concerns and discuss common concerns. I hope some-

ately improved health outcomes.

Eleanor Pierannunzi of Woonsocket, RI, attends the pre-diabetes SMA run by Tong, an assistant professor of medicine at Alpert Medical School, and clini-

BILL MURPHY/LIFESPAN

COOL TOOL

More Than a Game

Software helps kids learn how to live with peanut allergy.

A computer game developed to help children learn to control their peanut allergies is being tested in a pilot trial led by Elizabeth McQuaid, PhD, associate professor of psychiatry and human behavior (research).

The project is a collaboration between McQuaid's research group at Hasbro Children's Hospital, where she is a staff psychologist, and Virtually Better Inc., a company that creates health care software.

The game presents three scenarios that children with allergies often experience in school cafeterias, including one involving the child being bullied because of a food allergy—a situation that has been reported by students, McQuaid says.

After completing the scenarios, children gain access to other games such as reading food labels and playing a matching game with pictures of children experiencing a specific symptom of an allergic reaction. Children earn points in the game, which can be used to buy items for a virtual aquarium.

As part of the pilot trial, McQuaid and her team is visiting 32 families with children ages 8 to 12 to solicit feedback on the computer game.

The number of children with allergies has increased over the past decade, with 6 to 8 percent of the population now affected, McQuaid says. The game focuses on peanut allergies specifically because they are common and because children are unlikely to outgrow them.

While resources are available for parents of children with allergies, there are fewer resources specifically for children, and those resources tend to be passive materials like pamphlets, says Josh Spitalnick, vice president of research and director of clinical services at Virtually Better. The interactive computer game is “not just providing education, which it does—it’s providing the chance to practice real-life skills in a safe way on your computer,” he says.

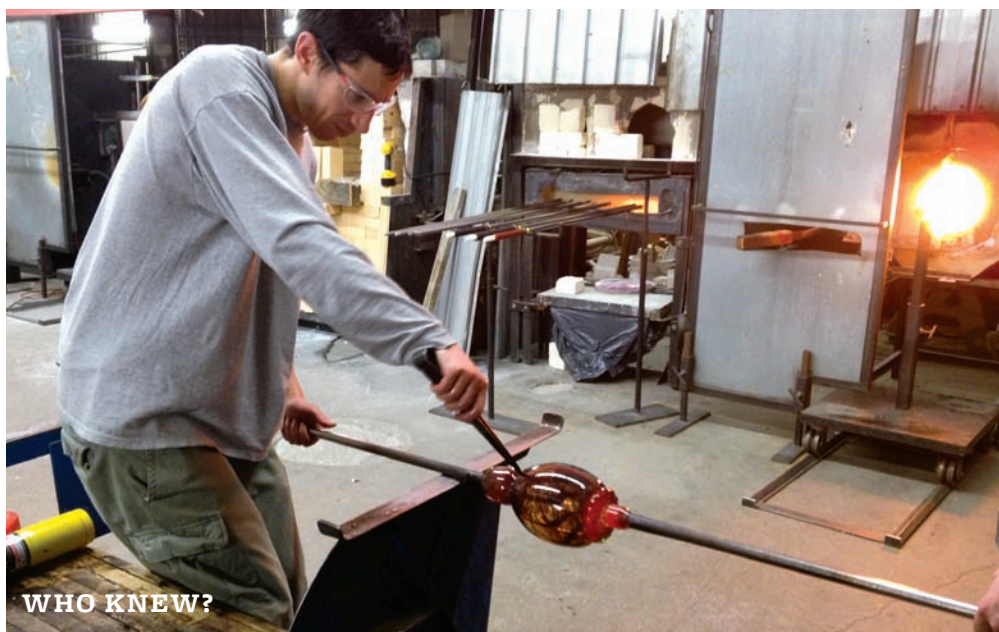
“Software is known to have success in achieving behavior modification in general, and the area of food allergy should be no different,” Russell Settippene, MD ’80, an allergist and associate professor of medicine (clinical) who was not involved in the game’s creation.

McQuaid says reaction from parents and children has been positive so far. “Parents feel that it fits a need,” she says. “We hope it sparks a conversation between parents and children.”

Spitalnick says next steps include expanding the game scenarios to encompass situations such as birthday parties, sleepovers, and restaurant dining and developing games for other allergens. Researchers will then test the effectiveness of the software in a randomized clinical trial. If that goes well, Virtually Better may sell the computer game directly to families and school districts.

—Steven Michael ’16

A version of this article originally appeared in the Brown Daily Herald on November 6, 2013. Reprinted with permission.



Glass Act

At Diablo Glass School in Boston, Matt Erlich MD’16 transfers a glass bowl to a puntill, a temporary “bridge” of glass, with the help of a friend so he can work on the other end of the piece. Erlich, a Boston native, makes time every couple of weeks to return to his hometown and work in the studio, where he’s also taught lessons and volunteers at the school’s events. The former union organizer, who caught the artisan bug from his carpenter dad, says glassblowing is “one of the things that relaxes me and distracts me from the craziness of studying.” And, he adds, “it makes for great wedding gifts. It’s a little more personal.”

—P.H.

FROGGER
Seeing how far
a frog can jump
gives clues about
the capabilities
of the entire
species.



FINDING

Hop to It

Record-setting animals show us what their species can do.

The job of the bullfrog jockey is to inspire fear. Lunging headfirst, arms outstretched, slapping the floor with open palms, even yelling at their amphibians to out-leap the other cold-blooded contestants.

“The frog senses whether you are a scientist hoping it’s going to jump well or a deadly, reptilian-like predator who is going to eat it,” Henry Astley

landed in the Guinness Book of World Records.

Stumbling upon this report, researchers at Brown were skeptical—and a bit worried. Either the record book was wrong, or they were.

Thomas Roberts, PhD, associate professor of ecology and evolutionary biology, had studied how animals move for decades, yet science had never re-

“The frog senses whether **you are a scientist hoping it’s going to jump well** or a deadly, reptilian-like predator.”

PhD’13 says of the entrants in the annual Calaveras County, CA, Jumping Frog Jubilee.

The jubilee was first made famous in 1867 in Mark Twain’s short story “The Celebrated Jumping Frog of Calaveras County,” then again in 1986, when a bullfrog named Rosie the Ribiter jumped more than 2.1 meters in a single hop and

ported a bullfrog jump beyond 1.3 meters. He and colleague Richard Marsh, PhD, adjunct professor of ecology and evolutionary biology, puzzled over this discrepancy.

Knowledge of animals’ true abilities informs studies of physiology and biomechanics, such as the interplay of tendon and muscle. It also allows biologists

to formulate new hypotheses for species evolution and provides benchmarks for animal health. So, in 2009, in search of the bullfrog’s true maximal performance, Roberts, Marsh, and their team trekked to California.

At the jubilee they rented frogs to see if the local animals were simply better jumpers. But the team was no more successful with those frogs than with Rhode Island frogs. Their analysis of 3,124 videotaped jumps from the competition yielded better results, which they published online in October in the *Journal of Experimental Biology*.

Lead author Astley, now a postdoctoral scholar at the Georgia Institute of Technology, videotaped leaps as long as 2.2 meters, shattering previous scientific reports. Professional frog jockeys averaged 1.5 meters per jump, typically beating the old research-grade mark, while the amateurs consistently fell short.

The celebrated secrets of Calaveras County frog jumping perhaps lay not with the frogs themselves, but with the approaches of their human coaches.

Over decades of jubilees, pro jockeys developed special techniques—rubbing their frogs’ legs before dropping them to the ground and lunging after them with gusto. “The frog knows the will of the jockey,” Astley says.

With the best recorded jump of 2.2 meters now known to science, the question remains: is that the best a bullfrog can do?

It’s probably close. Roberts and Astley say the distance matches their theoretical predictions based on frog muscle force and energy, and jump velocity and angle. Also, the jubilee’s historical records show the maximum reported distance has leveled off. The next generation of frogs—and jockeys—has a challenge in front of them. One thing’s sure: if a bullfrog manages to surpass the record, Brown researchers will jump to revise their calculations.

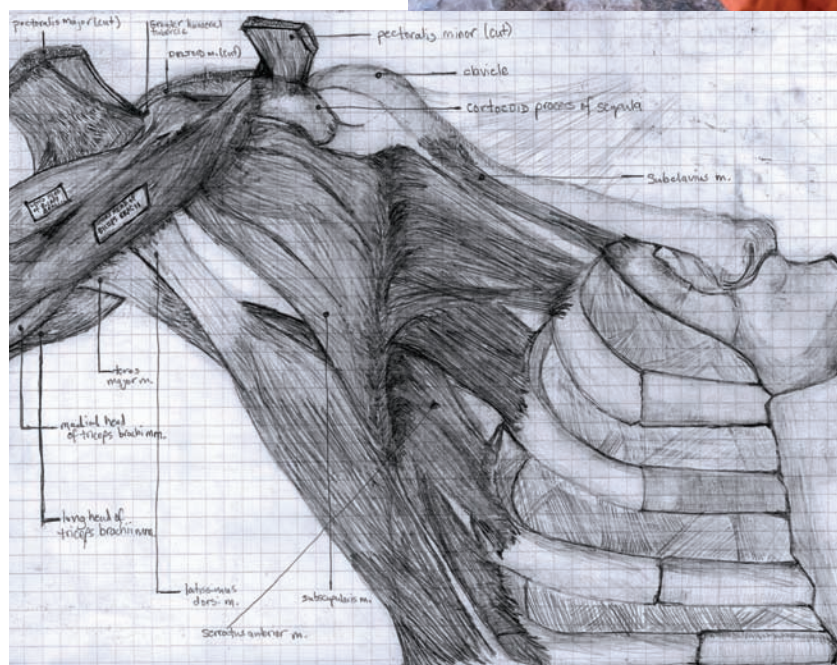
— **David Orenstein and Josephine Benson ’17**

COURTESY ROBERTS LAB

STUDENTS

Creative Outlet

David Greenky MD'16 backpacked through Southeast Asia in 2011 before starting his post-baccalaureate program at Goucher College. At Angkor Wat in Siem Reap, Cambodia, he captured this portrait (right), which last fall was among several pieces of photography, poetry, prose, and other work featured in the debut issue of *The Quince* (thequincereview.com), Alpert Medical School's first literary review. Though co-editor-in-chief Zoe Weiss MD'16 describes the online journal as "a patchwork of pieces from the medical community," she notes that submissions needn't be about medicine. Faculty and physicians as well as med students have contributed to *The Quince*, and alumni are encouraged to submit work as well. Show off your secret talent and send your best stuff to AMSLiteraryReview@gmail.com. —J.B.



(Above) A piece from the "People Around the World," series by David Greenky MD'16. (Left) "Upper Extremity 2" by Sam Klein MD'16.

Ask THE EXPERT

Stents Stunted

Renal artery stents offer no benefit.

According to the findings from a national research trial, people who suffer from renal artery stenosis—a narrowing of the arteries that lead to the kidneys—do not experience better outcomes when renal stenting is used. Instead, a comprehensive regimen of drug and medical therapies works just as well. Professor of Medicine and Director of the Division of Kidney Disease and Hypertension Lance Dworkin, MD, and Professor of Diagnostic Imaging Timothy Murphy, MD, led the study in collaboration with multiple investigators worldwide. David Orenstein talked to Dworkin about the results, which were published in the *New England Journal of Medicine*.

What did the CORAL (Cardiovascular Outcomes in Renal Atherosclerotic Lesions) study find?

There was absolutely no difference in outcome between patients who were stented vs. those who were treated medically alone. They are exactly the same, and the study was powered to detect a 25-percent difference. It's really pretty unequivocal that there is clearly no benefit in terms of hard clinical events such as mortality, stroke, heart attacks, and progressive kidney disease.

If you look at the outcomes in both groups or even just in the medical therapy alone group, they are pretty good. A majority of patients did well on the medical therapy. ... We've come up with a medical regimen that's practical and very effective in these patients. That may be one of the most important outcomes from the trial. Besides just answering this question about whether the stenting is useful, we've sort of established what could become the standard medical approach to treating these patients.

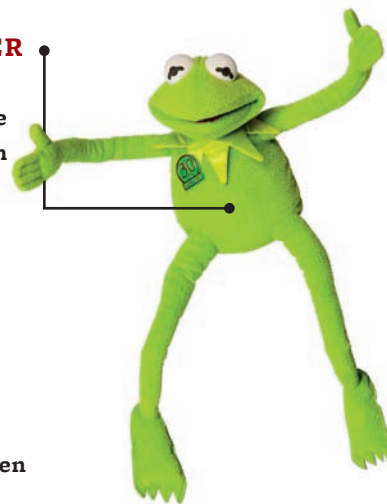
ANATOMY OF A RESEARCH ENGINEER

The Tinkerer

Sometimes people come to John Murphy looking for ideas. Sometimes they're just looking for nuts and bolts. Whatever they need from the BioMed Machine Shop, he's there to help. "I just make things and keep people smiling," he says. Murphy splits his time between the shop, which serves the entire division's research community, and the Donoghue Lab in the Department of Neuroscience, which develops brain-machine interfaces, designing and building prototypes for devices that do everything from shielding x-ray technicians from radiation to tripling injection output during brain surgery to simultaneously feeding thousands of fruit flies. And he doesn't stop tinkering in his free time. He helped local high school students convert a Model T into an electric vehicle and made his own skijoring equipment to dash through the snow with his three yellow Labs, including Sandy the canine supermodel. Dog training is his "first love," Murphy says; but it seems like he's always having fun. "I'm like a kid in a candy store down here," he says in the machine shop. "I can't get enough of it." —P.H.

PUPPET MASTER

At Design Lab in Providence, where he worked for more than 20 years, Murphy developed hundreds of toy and game prototypes. He co-invented the patents so that this 30th-anniversary Kermit the Frog doll can talk, sing, and even chomp a buzzing fly.



THE TIN MAN'S FRIEND

Murphy inherited this oil can with the machine shop. "It's kind of old, but it doesn't fall over," he says. "All the other oil cans fall over."

ADAM MASTOON

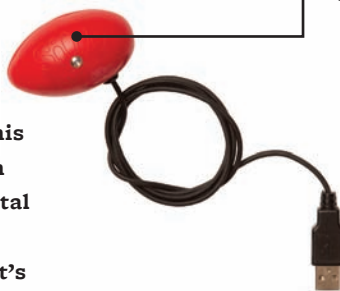
IDENTIFYING FEATURE

"I always wear this hat. If I want to go incognito, I don't wear the hat."



FOR GOOD MEASURE

Murphy still uses this analog caliper, even though he likes digital better. "These are classic," he says. "It's in my pocket all day."



INCREDIBLE EGG

This prototype contains not the classic bouncy toy but an accelerometer and a gyroscope to track the movement of the hand that holds it. The finished product, which Murphy is developing for the Donoghue Lab, will assist kids in occupational therapy.



LITTLE BLACK BAG

With this in hand, Murphy's ready for anything. At the photo shoot, it held the pliers he needed when the photographer, Adam Mastoon, had to loosen a stripped bolt on a light.

LIGHTS, CAMERA, SNACK

A trained search-and-rescue dog, Sandy's usual reward is a tennis ball. "If you use food, the dog focuses on the food and you lose the dog," Murphy explains. But when trying to get her to sit for this photo, that focus was just what he needed.



STUDENT

Think Globally

A summer in the field provides valuable experience for a medical student.

Two months in the tropics would be a long, relaxing vacation for most of us—but not for Rachel Blake MD'16. Instead, she spent last summer in the Philippines assessing the effects of a parasitic worm infection during pregnancy on infant growth and development.

Blake's research proposal won her a Benjamin Kean Travel Fellowship from the American Society of Tropical Medicine and Hygiene, which helps medical students gain early, hands-on experience in global health.

The Summit, NJ, native says she'll continue to work in the field. "We have

many maternal-child health issues here, but they're much more severe in poorer countries," she says. In the US, almost every diagnosis is backed up by a test, but in developing countries, doctors must rely almost exclusively on physical examinations.

Blake conducted her research at the Schistosomiasis Research and Training Center in rural Leyte, Philippines. Though schistosomiasis, an anemia-causing worm infection, is treatable, the standard drug, praziquantel, has not yet been approved by the FDA for use in pregnant women (see *Brown*

Medicine, Spring 2008). As a result, babies born to women with the parasite have a higher chance of low birth weight (LBW), which can lead to slower growth and development during infancy and childhood.

Blake compared the development of LBW infants in Leyte to that of such infants in the US and Europe, where they and their mothers have more consistent access to care. "We take so much for granted in the US," she says.

To determine the extent of LBW's detrimental effects, Blake is following fetal growth rates in infected pregnant women treated with praziquantel. Separate studies will investigate whether treatment for schistosomiasis during pregnancy impacts growth during infancy as well as nutritional status and risk of schistosomiasis infection to age 5. Because travel will be difficult during her remaining years at Alpert Medical School and residency, she'll collaborate with researchers in the Philippines, who will monitor the children.

Blake was invited to present her work at the annual meeting of the American Society of Tropical Medicine and Hygiene in Washington, DC. Yet this wasn't her first achievement in global health. As an undergraduate at Princeton, she examined obstacles to success for Ghana's infant rotavirus vaccination program. The Ghanaian government has since incorporated some of her recommendations into their plan for vaccine distribution, and many other African nations are introducing similar programs.

"Rachel is incredibly self motivated," says her mentor, Jennifer Friedman, PhD '92 MD'96, associate professor of pediatrics. She commends Blake's diligence, including her mastery of a difficult statistical program crucial for analyzing infant health. "She was very motivated to have a firsthand experience in a low- and middle-income country," Friedman says. "Rachel has a sincere interest in improving the well being of children globally."

—J.B. 

"Rachel has a sincere interest in **improving the well being of children globally.**"



GLOBETREKKER

Rachel Blake MD'16 worked in the Philippines last summer. Back at Brown, she presented her work in the Scholarly Concentration Showcase.

Question Away

A patient struggles with not being heard.



Early in college, in Washington, DC, before I had taken my first midterm, I wound up in the emergency room with double vision. “*Diplopia?*” said the silver-haired physician, incredulous. “*That* just isn’t something we find in the young and healthy.” Above his head were two separate, hazy exit signs for the singular exit. I protested only weakly, trusting his confident, white-coated assessment over my naïve, distorted vision. “Keep smiling with those pink cheeks,” he called out as I left through the doubled door.

Several days later, over burgers, my roommate announced the sudden arrival of the irrefutable evidence: “Half your face isn’t moving,” she said, her own expression frozen. On the way to

the emergency room, I tried to step up, but fell back. Even through my jeans it was clear: once taut with sprinter’s muscles, my left leg was atrophying.

This time, my face spoke the seriousness. “Especially given your family history, there is a small chance it may be a brain tumor,” said the neurology resident. “But you’ll be all right.” Her wide eyes belied her assurances.

I was sent for scans and blood draws and more scans and a spinal tap. Finally, the neurology chief announced the cause by my bedside—not brain cancer, blessedly, he said, but the varicella-zoster virus. “This could have been much worse,” he declared. After a month of steroids, my face began to move again

and through exercise, my leg to regain its strength.

But below the skin there remained a question: Why does medicine fail sometimes to see past the clearly defined outer edges to the murkier truth underneath?

After graduation, in Chicago visiting my boyfriend’s family, it happened again. I began experiencing strange symptoms—feelings of weakness, unquenchable thirst, sudden blurry vision. “When I started to need glasses, it felt sudden to me too,” the doctor responded to my report, tipped back in his chair, hands behind his head.

“But just a month ago I could read a faraway sign that no one else with me

ESSAY

could,” I emphasized. “My vision has always been really good.”

“I know—it’s hard to think about having to wear glasses when you’ve enjoyed perfect eyesight,” he said. He closed the door, tipped his head for a sole question: “Tell me—have you been feeling anxious about college being done with?” I told him I was looking forward to the next stage of life, mostly. “I see,” he said, handing me a note to see an

dered a lung x-ray. “Test is negative. It’s just a viral cough, as I suspected,” she said, poking only her head through the door. “Plus, you’re wearing earrings. You can’t be that sick,” she laughed.


But in a sort of medical *déjà vu*, visible signs of ill health bubbled to the surface a few days later—this time in the form of a rash on both elbows. I brought the symptom to a dermatologist. He asked all the questions. Has this ever

symptoms are badly reported; some illnesses are rare; others, more common, are complex and multilayered; health care systems almost never give patient and doctor enough time to sort out these mysteries.

But the fact remains: the doctor’s job is not only to observe, assume, and test, but to ask, and to listen. The patient’s basic status, appearance, gender, and age can provide critical clues and a possible path to diagnosis. But they can also form an impression that is misleading: the young person who is, in fact, dangerously ill; the chronically sick person who is acutely ill; the pink-cheeked girl who knows more than she appears to.

Despite our limitations, patients understand more than we are given credit for, if not about the technicalities of medicine, than about our own bodies and experiences. We should be asked. We should be heard by physicians who don’t merely impatiently predict our responses, disregarding any answers that don’t comply, acknowledging only the responses that fit. And when we are wrong, or when we fail to remember, we should be guided to better observe and more carefully report.

What I am trying to say is this: we must work together. Especially as our health care system is reformed and as financial and medical burdens multiply, such collaborations will be critical. It seems the best, or only, way to cut through the assumptions and the mysteries and the vagaries.

As I write I can feel, in my left leg, a spasm, its slight, residual tremor. Sometimes the truth is quiet. Many times it is invisible. But often it is there just below the skin, only a question away. 

I was no longer young and healthy. I was diabetic. I cried. The new label would also conceal.

ophthalmologist, his gaze somewhere beyond my face.

The next morning, I dragged myself to my laptop, collapsing into an armchair to rest before I even reached the kitchen table. I did a search of my symptoms—those the doctor had asked about, and those he had neglected to and that I had failed to remember to share. The answer was clear. I went to the ophthalmologist; he confirmed it. “There is nothing structurally wrong with your eyes,” he said. “They are temporary clouded by excess glucose.”

I was no longer young and healthy. I was diabetic. I cried. The new label would also conceal.

Half a decade into the disease, in New York City, I became acutely ill with a hacking cough, too weak even to remove my pearl earrings after my workday. “You’re a type 1 diabetic,” summarized the clinic doctor superfluously. “You’re susceptible to viruses.” She asked a few, general questions and or-

happened before? What are your other symptoms? Where have you traveled in the last few months? He listened. He asked more questions. He tested.

He called me at work: I had both Lyme disease and ehrlichiosis. The combination was potentially dangerous—with up to 50 percent of patients hospitalized, he said—and so rare for a Manhattan resident that the CDC would call me to confirm it.

I asked him how he’d figured it out. “The rash was interesting,” he said. “But it could have been eczema. It was your other reported symptoms and trip to Cape Cod that made me deeply suspicious.” I thanked him profusely. “Just took a few questions. It was nothing,” he demurred.

LOOK A LITTLE DEEPER

Doctoring is far from easy, in fact—I understand that as a patient, as a resident’s wife, as a biomedical writer. Patient histories are notoriously incomplete;

RESIDENT EXPERT

BY ALEXIS DRUTCHAS, MD RES'

In This Together

The bonds between residents sustain them.

We all sat in a circle after morning rounds; no one wrote their progress notes or discussed patients, no taps of a keyboard punched the air. The question lingered in the room: "How are you all doing?"—a painful but welcome topic we had not had the chance to process amid the busy days and cerebral walls so easily constructed in medicine. Each of us looked down, pulled on scrubs, or reached for a tissue. One by one everyone began to speak, tears making their way down each face as the emotions from the last few nights started to come undone.

On the road to pursuing a medical career, we are aware that it will be difficult. Yet what is not as saliently discussed is that we will not only be privy to, but deeply involved in the emotional situations that we see our patients through. This is one side of medicine, however, that we do not always take time to



turn for the worse, I left the hospital, got in my car, and began to cry—something I had held back for days.

The next morning the team finally spoke about the heartbreak we felt for our patient. Toward the end of the gathering I got up to go to the OR for a scheduled c-section, leaving before the group had dissipated back into the day. I heard Jenn get up and follow me out of the room. She and I had known each other for the last eight months. We had exchanged friendly words at work and residency get-togethers, but did not know each other well. That morning she wrapped her arms around me and began to sob in my arms, the strength that we both held finally breaking down.

I have been through other distressing experiences with patients before, but never have I felt something like this: a deep understanding with a colleague, possible without words. Although time

has brought healing, this experience is one that we both hold close. Talking about it months later, we both have said how it reminds us that despite the emotionally complex role we play in medicine, we share it with colleagues who, if we're lucky, become our support and our friends. These bonds we create are like none other. Let us not forget the depths that these relationships are able to hold, that in opening up we are able to share the despair and the joy, and bring not only healing but new light and purpose to our work.



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Alexis Drutchas is a second-year family medicine resident. Originally from Detroit, she studied environmental health and biology at the University of Wisconsin–Madison and completed medical school at Wayne State University.

That morning she wrapped her arms around me and began to sob in my arms.

share, or to lean on one another to process and endure. How do we experience this as individuals and as part of a team? Whom do we go to, and where do we find meaning and strength in our work when this path can expose us to some of the most painful aspects of the human experience?

Last spring while I was an intern on our obstetrics service, a patient presented late at night with contractions very early in pregnancy. My co-intern Jenn and I were both part of this patient's care; I was on the day shift and she was on overnight. We got to know the patient and her family, and maintained hope in the resolution of her signs of early labor. Despite this, the last night while Jenn was with her, she tragically lost her twins much before any chance of viability. That evening after sign-out, knowing that our patient's situation was taking a

PROGRESSNOTES

BY MICAELA HAYES, MD RES'09



Hope Springs

A doctor finds purpose in caring for patients with eating disorders.

“I’m fine,” she insists. “There is nothing wrong. I am better.” For a young woman who runs five miles a day, does an hour of additional cardio and calisthenics, and eats a salad, a fruit, and sometimes soup in 24 hours, nothing could be further from the truth. Eyes fixed on the floor, she bashfully admits that she only comes to our visits because her mother insists. “It was our deal to be able to come to college.” Her best friend has noticed she’s pushing too hard. Her mother, with whom she talks every day, is unaware. “I tell her I’m fine. I don’t

want you to talk to her—she’ll just overreact.” Having reached an impasse, I articulate clearly and gently why she is not fine, and we agree to meet again in a week.

This quiet, shy, stubborn woman so clearly immersed in her anorexia illustrates beautifully the challenges of caring for patients with eating disorders in a college setting. The freedom and minimal supervision that most college students use to expand their horizons—make friends, explore ideas, try new activities, experiment with relationships (and substances!)—also allows

students to turn inward and restrict themselves physically and emotionally.

Having spent nearly three years working intensely with this population, I can see that my patient’s current trajectory leads deeper and deeper into her illness, with increasing exercise, weight loss, and isolation. I have cared for her future self, who has osteopenia from prolonged amenorrhea, who gets chest pain with exertion but still climbs Mt. Nittany, who has spent years of her life engaged in intensive treatment yet still wakes each day to the voice of her eating disorder, driving her to deny and deprive, commanding her to slowly waste away.

I desperately want to call her mother. My patient needs more support, more accountability, perhaps even a break from school, to successfully fight this illness. And yet she’s an adult. Without her permission, I can only break confidentiality when she is medically ill enough to be in significant or immediate danger. If she loses weight rapidly, develops severe bradycardia, shows bone marrow suppression, or endorses suicidality or self-harm behaviors, then I can ethically involve her family against her wishes. For now, I must hold the course; I will see her often, watch closely, and hope that some part of her hears the message and can genuinely engage in treatment.

CALLED TO THIS

I love caring for patients with eating disorders. When I completed residency four years ago I had never knowingly cared for a patient burdened by this difficult illness. Diabetes, heart disease, and hypertension were my bread and butter; eating disorders weren’t even a

KLUBOVY/ISTOCK PHOTO

blip on my radar. Now I can't imagine my practice without these brave, bewildering, beautiful patients. Each patient's unique struggle teaches me anew to listen, to accept, to affirm, to ally *with* the patient, and to never close the door on hope. The story of how this happened is a mixture of serendipity, stubbornness, and the luck of having a great team.

After residency, our young family moved to central Pennsylvania so my husband could become an assistant professor at a large research university. Realizing that a traditional internal medicine job would require either a full-time nanny or an additional spouse, I decided to give college health a try, and quickly found myself up to my axillae in sore throats, red eyes, and swollen ankles. The first year I spent becoming facile with a whole new set of patient presentations, learning the cycles of what shows up during syllabus week (week-long alcohol benders), during the mid-semester crunch (chest pain from anxiety), and after spring break (well... you know.) The second year I really started missing the patient continuity that originally led me to primary care; I had picked up some longer-term patients with depression or anxiety, but most of my patients I saw once or twice and then not again.

Shortly before my third year our eating disorder expert left. Despite the 50-plus patients who needed care, few physicians expressed interest in taking on her patients. Eager for a challenge, I jumped right in.

And before I knew it I was drowning. Patients would look fine and declare themselves "fine" but have a potassium of 2.5 or a heart rate of 35. Patients would be unable to pack food, grocery shop, or

eat their extra snacks but find time to go drinking three nights a week. Patients would come back week after week, saying the words of recovery but never making any actual changes.

Some days I wanted to exclaim, "Oh, my God, just eat!" Instead I adopted my most open body language and said, "Tell me more." And the stories they told: dysfunctional families, abusive relationships,

substance abuse, sexual and physical traumas, depression, suicidality. They battled each day to function despite the demon perched on their shoulder, belittling them, commanding them to manipulate, deny, deprive, harm, isolate, and hurt. No wonder my patients struggled to make progress!

Slowly I began to find my footing. I adopted a Reaganesque approach to information: trust but verify. I do talk with a lot of parents. I became gently explicit when quantifying behaviors—"not that much" exercise can mean two to three hours a day and "normal" drinking can be five to ten drinks, three nights a week. I learned when to check labs, when to prescribe medications, and when to leave well enough alone. Growth curves—rarely of interest to internists—became invaluable in understanding weight changes and defining a target weight. Our regional eating disorder medical expert provided advice whenever I felt in over my head. And through it all our eating disorder treatment team

provided invaluable support, teaching me about their own disciplines (nutrition, psychology, psychiatry), developing treatment plans, and providing emotional support for what can be very difficult work.

This morning, there was a message waiting for me that has been two years in the making: "Dr. Hayes, I am ready to give treatment another try, for real this time."

"Dr. Hayes, I am ready to give treatment another try, for real this time."

When we first met, she described running to exhaustion daily, eating under 1,000 calories, and wanting to be "skin and bones." Despite attending weekly therapy, taking antidepressants, and seeing the dietician, nothing ever changed. Always I brought her back to the big picture: what does the future look like? What are your goals in life? Do you want to spend the rest of your life with Ed (eating disorder) on your shoulder? At times I felt like a broken record. This semester, somehow something changed. After years of being closed to recovery, she has opened up and decided to take a chance. She wants to go for more intensive treatment; she is willing to take a semester off of school to focus on getting better. I am once again hopeful. 📖

Micaela Hayes provides primary care and women's health services for undergraduates, graduate students, and spouses at Pennsylvania State University's Student Health Center. She previously wrote as Brown Medicine's Resident Expert.

PHYSICIAN FIRST
Bob Klein with a
patient—his favorite
part of the day.
“I love the teaching
and development of
caregivers,” he says.
“But it’s the children—
you just want to do
everything you
can for them.”





ZOOM

BY PHOEBE HALL

PHOTOGRAPH BY SCOTT KINGSLEY

Young at Heart

The top doc for kids decides it's time to let someone else have a turn.

Around Hasbro Children's Hospital, Robert Klein, MD, has something of a reputation as a sharp dresser.

But the pediatrician-in-chief and medical director will happily shed his tailored suit jacket for the simple white coat that marks his true calling. "I get to go see kids," he almost sings as he slips on his doctor's uniform and steps out of his corner office and into the hospital.

The smile that lights up his face and the spring in his step belie Klein's 70 years. But after 13 years at the hospital, including seven as its top doctor, he insists it's time to retire.

"I feel that I'm just old," says Klein, who will step down in June. "It's time for me to turn it over to someone else. I'm leaving the hospital in a fine place, but it's time for a different look at things."

Hasbro Children's Hospital, which turns 20 this month, has much to celebrate, in large part due to Klein. "He's taken Hasbro Children's to an incredible level," says Alan Hassenfeld, director of Hasbro Inc. and Klein's co-chair on the hospital's Advisory Council. "Rhode Island should be so proud not only of Bob but of Hasbro Children's and the work done between Brown and Hasbro Children's. ... It's remarkable."

The hospital sees more than 30,000 primary care patients every year, and the emergency room gets more than 50,000 visits. Klein adds that 90 percent of the state's "very sick" children are treated

ZOOM

at the hospital, and about 70 percent of Rhode Island pediatricians trained there. “We have a tremendous impact,” he says. “A large percentage of Rhode Island’s population passes through our doors every year.”

That influence is aided by the state’s diminutive size: Rhode Island has one of the highest rates in the country of adolescent immunizations and among the lowest incidences of childhood lead poisoning, and it leads the US in H1N1 vaccinations for kids. The hospital collaborates closely with the state Department of Health to identify and resolve public health concerns, such as a recent bacterial outbreak that was quickly traced to a swimming hole, which was promptly closed. “You couldn’t have this success in other states,” Klein says.

A MEDICAL HOME

“I’m proud of our hospital. The patient experience and safety have improved significantly while I’ve been here, but our role has changed over the

team, under Klein’s direction, “dreams and envisions ways to ... serve the children of the state of Rhode Island. We think about where we fit into health care reform and what our role could and should be in the future of child health in the state.”

Many credit that shift in focus to Klein. He encourages staff to visit not only community organizations and schools but also patients and their families at home, to try to understand their everyday lives in order to offer better medical advice. “Child health has to be larger than a traditional medical setting,” Flanagan says.

It’s an approach Klein has followed for decades in his study of pediatric asthma. “You can’t understand what is going on with kids if you just see them in the hospital. You really have to get to live their life,” he says. “A clinic visit is artificial.”

He first applied this concept at Dartmouth, where he founded a summer overnight camp for children with asthma.

“You can’t understand what is going on with kids if you just see them in the hospital.”

years,” Klein says. “We’re not just a hospital—we’re a medical center. We understand and prevent illness, we promote wellness, as well as emergency and inpatient care. Healthy children are our goal.”

Patricia Flanagan, MD, chief of clinical affairs, says the hospital leadership

“At camp, rather than see the child in the clinic, you live with the child. You can really fine tune their treatment,” he says. Prevention and education were key components of the asthma camp, he adds. “We were moving from episodic treatment to prevention—we could prevent kids from getting sick.”

In the mid-1980s word of Klein’s work spread to Brown, where Gregory K. Fritz, MD, now Hasbro Children’s Hospital’s associate chief and director of child psychiatry, was studying symptom perception in kids with asthma. “I contacted him out of the blue,” Fritz says. The two began to collaborate on research, working at the camp for two weeks every summer.

“It was a well-functioning camp with strong medical support that allowed those kids to go to camp overnight,” Fritz says. “Parents worry; many never let them [children with asthma] sleep away from home. Bob understood the importance of that developmentally.”

After 19 years in Hanover, Klein decamped to the University of Texas Health Science Center at Tyler, where he also founded an asthma camp. Fritz’s two-week summer research trips shifted to the South, with the support of NIH research grants. “Before the camp, there was no way to get that repeated, objective measure of symptoms,” he says.

Fritz says of Klein, with whom he has coauthored more than 30 publications: “He’s at heart a clinician, but he’s very interested in research. You can’t do clinical research without somebody like that. You’d be dead in the water.”

BACK EAST

When Fritz heard that Klein and his wife, Carlye, were ready to return to New England, he urged Brown’s chair of pediatrics to create an asthma center to lure his old friend to Providence. With startup funding from the philanthropist Lisa Van Allsburg, Hasbro Children’s Hospital founded the Asthma and Allergy Center in 2001; Klein be-

came the center's director as well as professor of pediatrics at Brown.

"Prevention is right up my alley," he says of the center's mission. "The focus on promotion of health rather than treatment of illness—that's where medicine should be going."

The center's pediatric asthma education program, Draw A Breath, embodies that mission. Initially funded by Van Allsburg and her husband, Chris, author of *The Polar Express*, each year the program helps hundreds of asthmatic children and their families manage the condition with classes, parent support groups, and community outreach. Draw A Breath, which also receives support from CVS/pharmacy and the Rhode Island Hospital Foundation, is, Klein says, "one of the only such programs in the country with third parties paying for prevention instead of treatment. We were on the early edge of the movement."

The asthma center's community work prompted a new research interest for Klein and Fritz: asthma disparities among Latino populations in Providence, in particular how treatment adherence, symptom perception, and cultural differences affect the prevalence and severity of the condition. The hospital formed the Providence School Asthma Partnership in part to reach Spanish-speaking as well as low-income families.

"When we founded the asthma center, we were on the crest of a wave," Klein says. "Instead of how to treat asthma, ours was about self regulation—how families can take care of their own." The school partnership's classes dramatically reduced missed school days, overnight hospital stays,

and ER visits; by visiting patients at home, Klein and his team were able to identify asthma triggers, from mold and pests to particulate from nearby highways, and help families address those issues.

The work encapsulated everything Klein loves about being a pediatrician

"His personality is everything I would want to run a hospital," Hassenfeld says. He adds that Klein, whose professorship is named for Hassenfeld's mother, lives up to his family's philanthropic mission to improve the lives of children. "He has heart and he wants to make a difference," Hassenfeld says. "He

"If I had to do it all over again, I would do it the same. **Maybe I'd get to Brown a little bit sooner.**"

and, specifically, about studying pediatric asthma. "In an education and prevention program, you get to know your patients over a long period of time," he says. "I could have a positive effect. I could really have an impact." Klein equally loved teaching medical students and residents and, according to several colleagues, could talk to and work with anyone. Thus he had broad support when, in 2008, he was named chair of pediatrics at Alpert Medical School and chief of Hasbro Children's Hospital.

But, he says, the promotion wasn't his idea. "I was pushed into the corner office kicking and screaming," says Klein, who a year later was named the Sylvia Kay Hassenfeld Professor of Pediatrics. Nonetheless the reluctant leader exudes satisfaction for his charges' accomplishments. "I'm so proud of this place, so proud of our students and our residents and our faculty. We've recruited some great people," he says. "Every day I go home with a smile on my face."


wants to bring sunshine where there's been darkness."

"He's a physician first, last, and always," Fritz says. "He didn't ever move entirely into administration as some do."

Though Klein will shut the door on that corner office for good in a few months, he says he'll stay "minimally" involved with two ongoing NIH grants, studying the impacts of Providence programs on pediatric asthma, and he'll continue to serve on the hospital's Advisory Council.

Most of his time, though, will be spent in Vermont, where he still owns property near the New Hampshire border, not far from Dartmouth. "It's time to get back to the hills and check my woodpile," he says. With good friends, good books, and his six grandkids to fill his days, "I'm not going to be bored."

He closes this chapter of his professional life with no regrets.

"If I had to do it all over again, I would do it the same," Klein says. "Maybe I'd get to Brown a little bit sooner." 

FIELDNOTES



A Surgeon in the House

A nonprofit brings a sustainable surgical system to Nepal.

“Oof!” I catch my breath as I watch the staff physician examine the tiny newborn. The baby girl, just a few hours old, is swaddled and resting on her mother’s lap. The infant drops back a few inches and reaches up her arms as she lets out a loud wail. The physician smiles and speaks to the exhausted-looking mother in rapid Nepali.

The nurse standing next to me, one of a handful of medical professionals fluent in English at our hospital in rural Achham, Nepal, leans closer and tells me that the woman walked three hours as the sun set the night before to make it to Bayalpata Hospital, and was up most of the night with a complicated delivery. Knowing that women farther than a two hours’ walk away are significantly less likely to deliver at the hospital than at home, I am impressed that she was able to make the trip and, as I watch the newborn grasp her mother’s finger, grateful that she could. And, perhaps more sig-

nificantly, I am grateful that the complicated birth did not require an emergency cesarean section, which then would have been impossible to perform at our hospital.

It’s estimated that, worldwide, more than 11 percent of premature deaths and disabilities are due to surgically treatable conditions, including obstructed labor and traumatic injuries. In rural Nepal, comprehensive surgical services are more than 16 hours away by ambulance over unforgiving roads. Nyaya Health, the organization that runs Bayalpata Hospital in conjunction with the Nepali Ministry of Health, charted a long and arduous path toward creating a sustainable surgical system. From recruiting qualified Nepali surgeons willing to work in an area of extreme poverty and limited resources, to developing supply chain reliability, to ensuring consistent sources of electricity and water, to finding sustainable ways to cover surgery costs,

surgical development at Bayalpata Hospital has been a long time coming.

In 2011, Nyaya secured funding for a surgical suite where emergency surgeries and surgical camps could be conducted. Its construction was completed in late 2012, but Nyaya still struggled to find a Nepali surgeon. Just as in the US, it takes significant investment and vision to ensure that those geographically isolated from major cities still have access to essential and lifesaving medical care. But, early last year, on-site leadership found a surgeon willing to make this transition and, for the first time in Bayalpata’s four-year history, we would have on-site surgical care for emergencies.

After joining Nyaya’s Boston-based team in October 2012, I worked closely with co-founder Duncan Maru, MD, PhD, on various research and development projects, including surgical development. Maru travels to Nepal several times a year, and invited me to go with him last spring. Dan Schwarz, MPH MD’12 (*Brown Medicine*, Winter 2011), Nyaya’s former executive director, and I spoke frequently with Maru before leaving for Nepal. Since Schwarz’s first days

JESSICA DEANE ROSNER



in Achham, when Nyaya Health had nothing more than a small clinic, much has changed. Nyaya now works closely with the ministry, helping to provide high-quality health care at Bayalpata Hospital, with extensive networks of community health workers in the surrounding villages. When I was there, I met the hospital's new surgeon and saw the operating theater, although it was not yet open. Things were certainly different from Schwarz's earliest days in Achham.

I spent part of my stay updating our referred surgical patient log, which detailed patients' experiences and costs when referred to other hospitals. I met many patients whose situations underscored the need for on-site surgical capacity, like the 10-year-old boy who, after breaking his arm, had been cautioned not to move his elbow and now was un-

able to straighten his right arm at all; he had to be transported to a surgical center for an otherwise inaccessible surgery. But it was my last 12 hours in Achham that truly demonstrated the crucial need our surgical suite would fulfill.

Just before I left, a bus crashed about an hour away. Military personnel and civilians transported the 20-some critical patients to our hospital in the back of a flatbed truck lined with hay. It soon became evident that some of the most critical injuries would need to be transported to the nearest surgical center, in Nepalgunj, about 16 hours away. Maru and I traveled with the patients in ambulances over treacherous, unsafe roads. The patients never would have been able to make the trip without assistance; there was simply no way they could have been transferred safely without an ambulance.

Since I returned home, Bayalpata Hospital's surgical center opened its doors, and even completed its first cesarean section. Nyaya hosted a surgical camp in conjunction with specialist surgeons on leave from their teaching hospitals in the capital, and we are always looking for surgeons willing to travel to Achham to help train on-site surgical staff. As I prepare my own medical school applications, I recognize the impact that Nyaya Health has had on my perceptions of health care delivery both in the US and abroad. I hope to someday speak to new students traveling to Achham and be able to reflect on how far we have come. In the meantime, I hope to be able to support our work there. The on-site staff and global leadership consistently inspire me, and I want to remain a part of the team.

Read more about Nyaya Health's work at www.nyayahealth.org.



It was my last 12 hours in Achham that truly demonstrated the **crucial need our surgical suite would fulfill.**

Caroline King graduated from Brown with honors in community health. She is completing a post-baccalaureate year at the University of Pennsylvania and hopes to begin medical school in 2015.



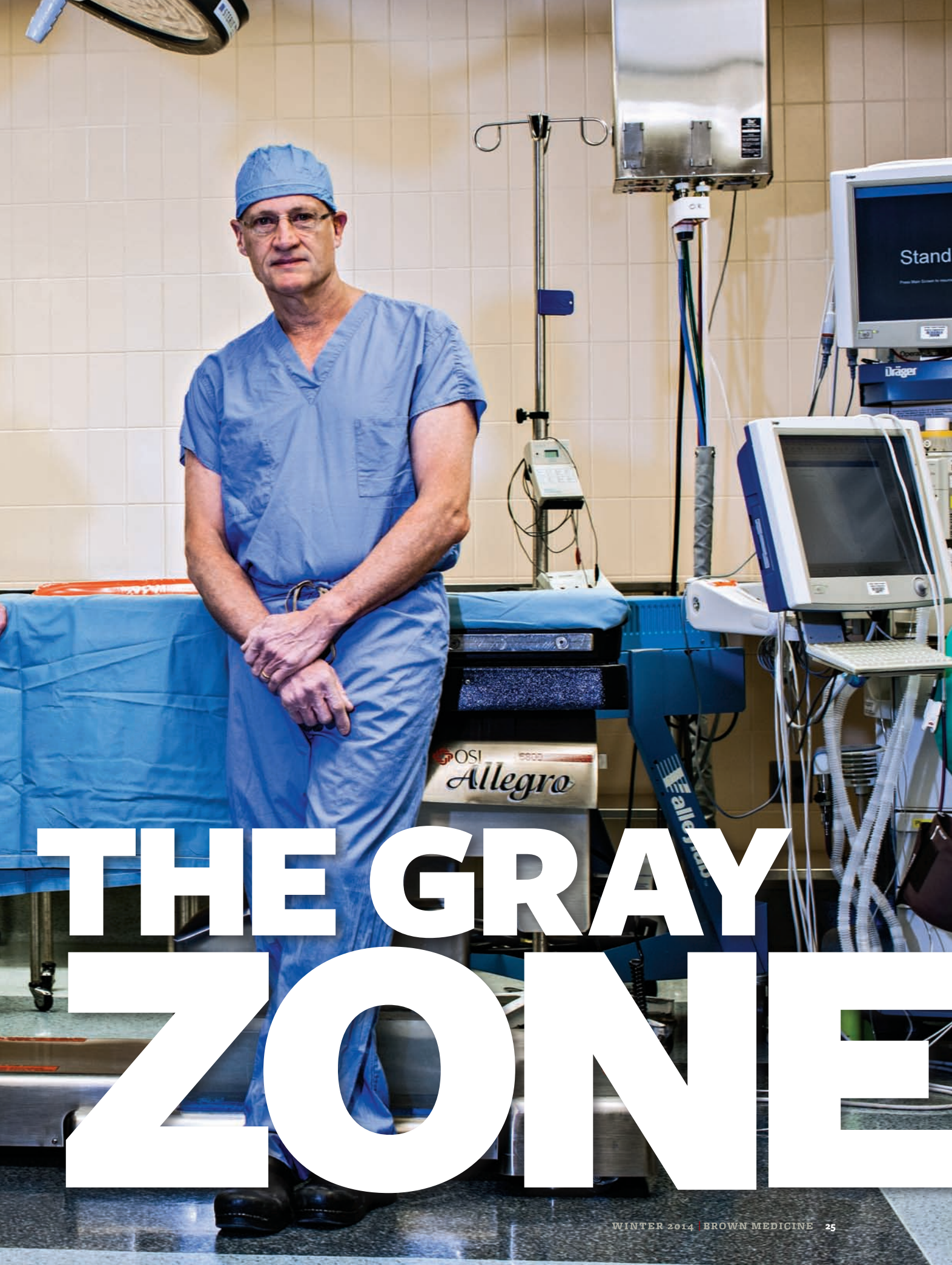
BY BETH SCHWARTZAPFEL
PHOTOGRAPHY BY JESSE BURKE

Advances in both surgical techniques and prosthetic limbs have left patients with traumatic injuries—and their doctors—with more options than clear-cut solutions.

NAVIGATING

FINE LINE

Orthopedic trauma surgeons Roman Hayda (left) and Christopher Born help patients decide between limb reconstruction and amputation.



THE GRAY ZONE

Heather Abbott woke up in the hospital, wondering if her foot was still there. It was, but barely: the heel was blown off, her ankle and dozens of the surrounding small bones broken. There was so much nerve damage that she couldn't feel the foot in most places. Here? the doctors would ask, hopeful. Here? as they poked or scratched. No, she'd shake her head. No.

A 38-year-old human resources manager at Raytheon, Abbott worked hard and kept fit: she ran 5Ks, she took Zumba and kickboxing classes. She lives in Newport, RI, and in the warm weather she spent a lot of time at the beach, swimming and paddleboarding. Every year on Marathon Monday her tight-knit group of friends goes to Boston to see the Red Sox, then eats lunch at the Forum restaurant to watch the runners cross the finish line. It was there, last year, that her life changed forever: she remembers a sound like a firecracker, crawling through the Forum, feeling like her foot was on fire. She remembers being carried through the restaurant by a former Patriots linebacker, waiting for an ambulance in a back alley, a woman saying Hail Marys, her friends crying. She remembers the ambulance pulling into Brigham and Women's Hospital. After that her memory is blank.

Three days later, Eric Bluman, MD RES'03 F'04 worked with a multidisciplinary team of vascular and plastic surgeons, trauma surgeons, and others on an exploratory surgery to evaluate whether they could save Abbott's foot. Now, Abbott had a decision to make. She recalls

that Bluman told her, "We can save it. But it will always be shorter than your right leg. You might not ever be able to walk on it. You'll definitely never be able to run. You'll have to have multiple surgeries, and you'll probably be in a lot of pain for a lot of years," Abbott says.

Together, Bluman and Abbott were navigating the "gray zone" that trauma surgeons face every time a patient arrives with a mangled limb: reconstruct or amputate? The answer is rarely clear cut.

"It's pretty easy when the leg is off," says Roman Hayda, MD, associate professor of orthopaedics and codirector of the Division of Orthopaedic Trauma at Rhode Island Hospital. "And it's pretty easy when the injury is simple. But then everything in between, it's not so simple."

Every year more than 30,000 people in the US receive an injury so severe that they reach this decision point. Each one of these patients must weigh a constellation of considerations: if I choose to try to salvage it, how well would my leg work? How would it look? How long would the process take? What if I chose amputation? Could I walk? Bike? Run?

How far? How much pain would I experience and for how long? Would people stare at me? Could I go back to my job?

For Heather Abbott, the priority was getting back to her active lifestyle—or as close a semblance to it as possible. "He thought it was important that I had the choice," Abbott says of Bluman. "But the way he described how my life would be, it wasn't a hard choice for me." That Monday—exactly a week after the April bombing—Bluman amputated Abbott's left foot and the lower half of her left shin.

For other patients, the calculus is different. "I was not prepared to lose my leg if there was any chance, however slight, that it could be salvaged," Evan told me. He and his wife, Katherine (who asked that their last name not be used), were walking along the marathon route, as they do every year, when the bomb went off. Both were severely injured—Evan lost sight in one eye and partial hearing in one ear, and both almost lost a foot in the blast—but Evan's foot was more complex and risky to reconstruct than Katherine's.

What Bluman told Evan was similar to what he told Abbott: trying to save his leg "would involve a long and uncertain outcome, and there would be a high risk of amputation downstream if salvage did not work," Evan recalls. But he was undeterred. "I was happy to cross that bridge if and when needed," he says. At 65, Evan had recently retired after decades as director of pharmacology at the Cambridge-based biotech company Biogen Idec, so he made his decision with a better understanding than most of exactly what he was taking on. "If there was a chance to save my leg," he says, "I was going to do it, I'll tell you."

After completing his orthopedic surgery training in 2003, Eric Bluman stayed on at Brown for a traumatology fellowship. The patients he saw there were mostly victims of blunt trauma, like car crashes. This is representative of most civilian limb-threatening injuries nationwide: they are usually caused by traffic accidents or incidents involving farm equipment or heavy machinery. Occasionally Bluman dealt with penetrating trauma like gunshots or stab wounds, but this type of limb injury is relatively rare in the US except in a few urban areas.

Then Bluman went to Iraq. A ROTC cadet in college, he entered active service in the Army after he had completed his medical training, and was deployed in 2006. “A door that had been open this much”—Bluman holds his thumb and forefinger together to demonstrate the small slice of his experience with penetrating trauma up to that point—“was

Hospital, he rushed to the Brigham to offer his help.

“I really hope I never have to do it ever again,” he says. “But it’s one of those things where you say, if there’s anything good that comes of being in a war zone, I guess that’s it.”

In fact, the wars in Iraq and Afghanistan have pushed the field forward in many ways, not the least of which is public perception. The thousands of soldiers coming home with prosthetic limbs have “sort of raised the level of consciousness of what an amputation means,” says Christopher Born, MD, Intrepid Heroes Professor of Orthopaedic Surgery and director of the Division of Orthopedic Trauma. “What we’ve seen in the last decade is people who have a prosthetic limb, who don’t try to cover it up. They walk around looking like robots.” As a result, Born finds that frequently his patients facing amputation are “fairly accepting, compared to years ago, when it was the last *possible* thing you would ever consider.”

you’re losing your leg,” says Roman Hayda, himself a retired Army colonel and former chief of Orthopaedic Trauma at Brooke Army Medical Center. “Because otherwise you’re losing your life. But we have evolved and we’ve really learned ways to save legs.”

Each generation improves upon the last: technologies developed in the last 15 to 20 years, like Silastic vascular shunts and vacuum-assisted wound closure, make increasingly more complex injuries possible to repair. New formulations of bone cements incorporate antibiotics that leach out at steady rates; these help prevent infection but stay local to the wound site, protecting patients from the type of problems that would result from receiving high concentrations of antibiotics through IV.

Changing perceptions of what’s salvageable have also moved the bar: “When I was training at Brown, one of the things that was a somewhat absolute contraindication to performing limb salvage was if the tibial nerve was cut,”

Patients facing amputation are fairly accepting, **COMPARED TO YEARS AGO.**

all of a sudden wide open,” he says. Almost 80 percent of combat injuries are caused by blasts: IEDs, roadside bombs, bullets, and shrapnel. Thousands of soldiers have suffered limb-threatening injuries this way. “It’s almost as if I did a whole second fellowship,” Bluman says. So when, years later, he saw news of the marathon bombing on the television in the waiting room at his office at Faulkner

Beyond the public perception are technical advances, both in salvage techniques and in prosthetics. As a result, the gray zone has rarely gotten narrower in recent history—if anything, it’s gotten bigger.

One hundred fifty years ago, there was little in the way of salvage. “If you’re on the Civil War battlefield, if you get a simple fracture, it’s infected, it’s open,

says Bluman. But improved rehabilitation and physical therapy techniques have meant that even patients who cannot feel their foot can learn to walk relatively well, and so “now we’re more apt to save limbs that have a major nerve deficit.”

At the same time, prostheses are becoming increasingly sophisticated. Heather Abbott says that when her pros-

BEACHCOMBER

For Heather Abbott, the decision came down to how active she could be with her own reconstructed foot versus a high-tech prosthetic. She chose amputation.





thetist lost his leg 40 years ago, he was fitted with a wooden leg. Now, cutting-edge prostheses have sensors, internal processors, and accelerometers to mimic as closely as possible the action of a human leg. “It would have been simpler if prosthetic technology was the same as it was 50 years ago and reconstruction technology moved forward,” says Hayda. “Then most people would get reconstructions. But that’s not so, because amputation technology has raised the bar too.”

Some of these high-end prostheses

and back into society,” Born says. “Here, do you want a Volkswagen or a Cadillac?” And financially, “Can you sustain that for the rest of your life?”

As a member of the International Medical Surgical Response Team, Born traveled to Haiti in the days following that country’s catastrophic 2010 earthquake. He was forced to consider not just what legs could be salvaged, but what legs could be salvaged there, in those circumstances. An injury that at home might have been a tough call, requiring extended discussions with family—or

“In Haiti, YOU GET A LONG JOHN SILVER wooden leg-type thing.”

can cost as much as \$100,000, and even patients with good insurance can struggle to get them covered. Prostheses need to be replaced every few years, and although the Affordable Care Act may make them more accessible, private insurance plans often have a price cap in the range of \$2,500 to \$5,000 a year for durable medical devices. (Insurance also typically caps the amount of physical therapy that is covered in a given year.)

Which is to say, the gray zone is relative: the kind of care and resources patients have access to post-injury must play a role in their decision-making.

“In Haiti, you get a Long John Silver wooden leg-type thing, which, at the end of the day, is probably pretty serviceable to get a patient up and around

even a limb that at home could pretty reliably be repaired—often had to be amputated. To save an injured leg, says Born, “You have to have an understanding of whether or not the patient will be able to have further procedures carried out in a timely fashion. Even if the patient is going to have some follow-up, you don’t know what kind of equipment they have, what kind of expertise and skills they have, what kind of sterility they have.”

It took the US Navy hospital ship USNS Comfort eight days to arrive at Port-au-Prince, and Born found that once it got there, he was much more likely to try to save a limb—even one with an identical injury to one he had amputated the previous week.

Over the years, those who work in the field of trauma have tried to make the gray zone more black and white.

In 1990, a group of Florida surgeons published a “Mangled Extremity Severity Score,” or MESS, which assigns points based on how well blood is flowing to an injury, the patient’s age and level of shock, and the mechanism of injury. More than seven points, and the algorithm recommends amputation. “But the MESS score is not one we really use,” says Born. Checking boxes may give the illusion of a clean answer, “but it doesn’t always work that way.”

Colleagues Born and Hayda have an easy rapport and a similarly thoughtful manner. Sitting in Hayda’s sunny Rhode Island Hospital office, his iPhone ping-pong and the road bike he’s ridden to work

through your mental checklist of how much muscle, how much of the bone is lost,” says Born. “Major nerves, what’s going on there? Major arteries, what’s going on there? There are other factors too: Is the patient sick? Are they diabetic? Are they a smoker? Are they going to be able to manage an amputation, or a one-year-plus salvage attempt?”

Hayda nods. “What are their other injuries? Sometimes [an injury to the leg could be] reconstructed, but because of what’s going on with their chest and belly and all this, you’re not going to be able to do the things you need to do to reconstruct it. If you just look at the limb you could. But everything else precludes it. Burn patients are like that. You can’t do a free flap. So they’re losing their leg.”

Then there’s the unknown: Which patients will become addicted to painkillers over the long months of recon-

severed from his body. He woke up to discover doctors had removed the lat muscle from the left side of his back in an attempt to reconstruct his injured leg. Many painful months followed: 11 operations, including endless cleaning and debriding. An external fixator with pins that entered his skin in several places. One infection after another, his leg so swollen and discolored that “it didn’t even look like a leg.” When a bone graft didn’t take, “I just lost my mind,” he says.

Eric decided to move back to his native Rhode Island, where he had family support and access to the orthopedics team at Brown. He arrived in Hayda’s office disheartened and frustrated. He hadn’t walked in a year. “We had this whole discussion: what is it that you want to do?” Hayda recalls. “We can salvage it. It would take at least a year—*another* year—without a guarantee. And he clearly said, ‘I’ve invested so much, I want to continue my investment.’”

Infection is the hobgoblin of successful reconstruction, and Hayda is involved in a research study meant to gain a better understanding of why some wounds heal nicely and others, like Eric’s, don’t. To date, surgeons simply have to use their experience and their gut to decide when to close a surgical site, and when to excise more tissue, debride again, and give it more time. They don’t usually bother to culture the wound before they close it, “because we know there’s very little correlation between what you sample and what ends up being a problem long-term,” says Hayda. “We don’t know exactly why.”

With this new study, Hayda and his co-investigators culture the wound using super-sensitive PCR technology, “and

Infection IS THE HOBGOBLIN of successful reconstruction.

stashed in the corner, it’s hard to imagine either of these soft-spoken men doing what they’ve done their whole careers: Born in a disaster area, Hayda in a war zone.

But here the two of them are, both with close-cropped silver hair and rimless glasses, bouncing ideas and questions off each other as they discuss the factors they weigh when they make recommendations to patients. “You go

struction? Which patients’ progress will be hindered by infection?”

Eric (who also requested his last name not be used) was in a motorcycle accident in August 2012. He lived in Florida at the time, and he was out riding with his buddies when a car cut him off and catapulted him toward a stop sign and then a tree. Eric doesn’t remember much about it, but “man,” he says, “you should see the pictures.” His leg was almost

then we follow them to see which of these ended up having a problem, and what kind of problem: did the bone not heal? Did they develop an infection? And did it have any correlation with the PCR results? We know that right now it's a crap shoot."

Brown is also a site in the multi-center OUTLET study, which aims to com-

fixator, which Hayda is using to slowly regrow the bone that was destroyed in the accident. There are bolts he must tighten several times a day, and "around the pin sites, where it goes through your skin, it can be sore," Eric says. Lately the pain keeps him up at night and, restless, he watches whole seasons of *The Walking*

good outcome," he says. Katherine can finally drive again, and that has made them considerably more independent. "I don't want to run a half-marathon or a 10K. I don't think that's going to happen," he says. "I like to think I can get cycling. I think that's a distinct possibility." Evan says the couple will be happy "if we can

"It still amazes me **HOW MUCH A BODY CAN TAKE ...**"

pare long-term health-related quality of life among those who chose amputation and those who chose salvage. Funded by the Department of Defense, the study is designed to help surgeons give more specific and data-driven guidance to gray zone patients making a decision. Right now, Hayda says, he is forced to say things like, "I think you will do better with an amputation." He mimics the conversation that might follow:

"Based on what?"

"Experience."

"Well, what is *that*?"

Hayda would like to be able to answer patients' questions as specifically as possible: "If you can walk, how far can you walk? If you can run, how fast?" OUTLET will help surgeons be able to say, "If you want to save it, that's fine, but this is what your level of function is going to be. You will have a very hard time going up stairs, for example."

Information like this might have changed Eric's mind. These days he moves around slowly, on crutches and in a wheelchair. He has another external


Dead on Netflix and then passes out during the day.

Sometimes Eric thinks about how different his life would have been if doctors had amputated in the first place. "Because it was below my knee, I would have been walking in a few weeks," he says. But then he thinks about his commercial drivers license, and how he needs his feet to get back to driving his truck one day. And he considers the investment he's already made. "If they didn't take my back muscle out, I would have told them to amputate it," he says. "Now I got this scar on the side of my ribs and everything, and I wasn't able to pick up anything on my left side because they took that muscle out." So an amputation would mean "now I'm missing my leg *and* my back muscle. No, I wanted to keep it. I was too much invested in it."

Evan, for his part, is happy with his progress. Six months out, he's begun to transition from a wheelchair to crutches, and he can stand on the foot for up to 30 minutes at a time. "I still have a ways to go but am still optimistic about a

get out and walk about and do limited hiking and drive again. And we can travel. I don't think there's anything that's going to restrict us. We'll just go for it."

As for Heather Abbott, she can walk short distances without a limp and now has a running "blade" leg and a leg for wearing high heels. She arrived at our lunch in jeans and knee-high boots, and walked to our table without a hitch. This summer she returned to the beach, and while she did not like the stares, she did go paddleboarding.

Even Hayda is impressed by human resiliency. "It still amazes me how much abuse a body can take, and given the right circumstances, given the right support, still do pretty amazing things," he says. "Go to war, get shot, get blown up, and bounce back. People getting tossed out of their car, run over, crushed between vehicles, and say, 'I'm OK.' It's incredible." 

Beth Schwartzapfel '01 is a Boston-based freelance journalist. Read more of her work at www.blackapple.org.



FIRST STEP

The first PLME class poses for a photo on August 29, 1985. Of the 60 students admitted to the class, 41 earned their bachelor's and medical degrees at Brown. Many who did not complete the program chose to pursue different careers; Stephen Smith says such attrition is a "success." "To help them make the right career decision is something teachers should do," he says.

From left, first row: Spyros-Nicholas Bartsocas, Sunita Sudanagunta, Ravi Srinivasan, Suzanne Lasser, Laura Garelick, Humberto Rossi, Jonathan Kurtis, Robert Li, Arun Jain, Justina Nu, Katherine Flanagan. Second row: Olive Osborne, Lisa Herring, Peter DiPippo. Third row: Amy Blunt, Arthur Salgado, Evans Valerie, Jessie Yuan, Gagan Bahadur, Apurv Gupta, Nicolle Lipper, Carey Farquhar, Jenny Hua, Marjory Gomez, Jacqueline Dejean, Monica Shah, Carroll Arrindell. Fourth row: Angela Fowler, Charles Leng, Kay Chang, Tri Nguyen, Robert Wolek, David Kuo, Henry Rhee, Nadeem Ahmad, Heidi Wainman, Katherine Mason, Gregory Johnson, Anthony Lombardi, Brent Lee. Fifth row: Evelyn Perepelyuk, Kirsten Jacobson, Lee Newman, Andrew Fras, Oliver Soldes, Rex Chiu, Christopher Laurence, Robert Morales. Sixth row: Jacob Blumenthal, Adam Amsterdam, Joylene John, Paul Varghese, Kimberley Townsend, Scott Moskol, Kuangwen Tsao, Jason Rosenstock. Not pictured: Margaret Chong, Hayden Hsiung, Sharon Jacobs, Howard Kornstein.

The Whole PHYSICIAN

Thirty years ago, a new approach to medical education was born. **A look at the Program in Liberal Medical Education.**

LIKE MOST STUDENTS on their first day of college, Humberto Rossi '89 MD'93 had no idea what he'd major in when he arrived on College Hill in 1985. He'd always liked mythology, so that fall he took a course on the origins of political thought in ancient Greece, and settled on classics as his concentration.

Over the next four years he studied Latin and classical literature, and spent his entire junior year in Bologna, Italy. It was a relatively normal course of study for a classics scholar, perhaps, but a privilege for someone with Rossi's career plans. "I would never have been able to spend a full year abroad if I had been in a more traditional pre-med program," he says.

Rossi had enrolled in Brown's eight-year continuum program, known as the Program in Liberal Medical Education. After their senior year, he and the 40 other members of that first PLME class—holding bachelor's degrees in biology

and chemistry, literature and music, engineering and women's studies, and everything in between—began medical school at Brown, where as high school seniors they'd been guaranteed admission.

Over time, the program has evolved in response to changes in medical education, but what was once an experiment has proved successful. It remains the only eight-year program in the Ivy League and is ever popular among applicants to Brown. For that first class of PLME students, it was untested. But the experience counts as one of the most formative in their careers, one that con-

tinues to enrich their personal and professional lives 30 years later.

Rossi, as a medical oncologist at Mass General Cancer Center at Emerson Hospital-Bethke, regularly counsels his patients as they struggle to come to terms with their illnesses. "People have crises about what their meaning in the world is, about what the meaning of life is," he says. "In recent years I've started to think more about these same problems as they were dealt with in classical literature and mythology. ...

"I think that my education in fields beyond medicine helps me to be in touch with their broader goals and helps them to achieve them while we're trying to achieve better health."

BRANCHING OUT

Though PLME students had to complete, or place out of, a few traditional pre-med requirements, little else about their education resembled what their peers were doing at other colleges. Free from the pressure of studying for MCATs and applying to medical schools, they played sports and joined clubs, studied abroad, and chose concentrations in whatever fields they wished to explore.

"The 'liberal' part of the program is it gives you the freedom to choose and experiment, to branch out," says Brent

Lee, MPH '89 MD'93, who concentrated in French and took courses in archaeology, prehistory, and Swedish during his undergrad and med school years. "I don't think I'd be a physician today if it weren't for that program—I would have gone into the humanities, international relations."

The PLME, which was approved by the Brown Corporation in 1984, was born in reaction to a trend in medical education toward accelerated programs of seven or even six years. "The American public complained ... about the lack of compassion and humanism in physicians. The PLME was a response to that," says Julianne Ip '75 MD'78 RES'81, herself a product of Brown's seven-year offering, the Medical Education Program.

The MEP graduated hundreds of students in the shortened time frame, but according to Stephen R. Smith, MD, P'01 MD'06, then associate dean of medicine, by the 1980s more and more students were taking the full eight years so they'd have time for undergraduate electives and other opportunities. "Saving a year wasn't part of the appeal," says Smith, now professor emeritus of family medicine. "So we said, let's do what students are already doing with their feet."

Smith credits David S. Greer, MD, then dean of medicine, and Howard R. Swearer, PhD, the University's 15th president, for conceiving of and championing the PLME. Smith calls Greer, who practiced general internal medicine before joining the med school faculty, a "visionary" who "really had a concept of what a doctor needed to be." Of Swearer, Smith adds, "He saw Brown as a university as having, if not a unique, then certainly a distinctive mission of educa-

tional innovation. ... He really wanted medicine to be integrated into the fabric of the University as a scholarly discipline, not just a vocational calling."

With Swearer and Greer's wholehearted support, the program's planning went relatively smoothly, Smith says. Most undergraduate departments readily agreed to the suggested changes to the pre-med curriculum, such as replacing two semesters of calculus with probability and statistics and reducing the chemistry course load. "PLME students get the very best that Brown has to offer," Smith says. "It's not shortchanging them of that at all."

A NEW PARADIGM

"Being a PLME took the pressure of getting into med school off so I could enjoy college for what it was," Rex Chiu '89 MD'94 says. An applied math and economics concentrator, he played lacrosse, pledged a fraternity, studied abroad at the London School of Economics and King's College London, cofounded the Chinese student association, and volunteered in the community. "I had a full college career," he says.

Smith had hoped the PLME would better integrate liberal arts education into the med school years, but the "humongous" curriculum, and the strict standards of external accrediting agencies, made that difficult. Also, he says, "it has to do with how medical school kind of grinds you down."

But the med school's emphasis on a "humanistic, holistic approach" nonetheless set it apart, says Ip, who was recruited from the faculty to helm the PLME and continues to lead the program, now as associate dean of medi-

cine. "The things Steve said 30 years ago are coming back around," she says. "He talked about an interdisciplinary approach to medicine, competency-based learning versus coursework, evaluations versus multiple-choice exams."

"They wanted to create an environment that was different than what the typical pre-med student was going through," says Howard Kornstein '89 MD'93, who studied piano in the applied music program and DJed at WBRU. "It instilled a sense that people should not be just robotic in their approach to medicine." The upstate New York ophthalmologist and clinical professor adds, "I try to take a compassionate, humanistic approach to training residents."

Jonathan Kurtis '89 MD'96 PhD'96, professor of pathology and laboratory medicine at Alpert Medical School, says he struggled in med school until he decided to pursue research and earn a joint MD/PhD. Now, having taught med students himself, he appreciates how "intellectually courageous" Ip, Smith, and the program's other founders were.

"Juli and Steve were ahead of their time," says Kurtis, who also directs the Lifespan Center for International Health Research, where he's working to identify vaccine candidates for malaria and schistosomiasis. "You need core competence [as doctors], but you need to be interesting in some other way. How do you inculcate that? ... They broke down a paradigm."

Several alums say that paradigm included a culture of "cutthroat" competition and "backstabbing." In contrast, Brown fostered collaboration and teamwork. "You're not a better doctor because someone did worse than you did"

in medical school, says Chiu, who practices internal medicine in Menlo Park, CA, and teaches Stanford med students. “Other doctors aren’t your enemies, they’re your friends. ... I try to impart that attitude to my students.”

“In a traditional program, you might have to focus all your efforts on getting into medical school, getting the best score on the MCATs, getting the best grades,” Rossi says. “And those goals might fall in line with the goal of achieving a fulfilling career, developing the self as a wise and educated and empathic person—but they might not.”

Rossi’s wife, Laura Garelick ’89 MD’93, says the program’s emphasis on work-life balance has helped her as a physician and a colleague. “I try to help my patients

“think of the community as your patient, not just the individual. If you don’t have that perspective, I don’t think you’re as prepared to succeed and affect the most number of people.”

That perspective prompted many PLME students to volunteer in the community. At a Providence clinic, Jessie Yuan ’89 MD’93 says, “I learned that there’s a huge disparity with the Southeast Asian community in terms of health care. That was really driving me.” Yuan learned Khmer so she could speak with Cambodian immigrants and, during her fourth year of med school and again during residency, she traveled to Cambodia to work in a pediatric hospital and with NGOs.

“The program really helped define my

also takes an interdisciplinary, case-based approach to medicine.

“You take a giant ship going one way and now we’re turning it,” Ip says. “It’s not a revolution, it’s evolution.”

But to charges that the PLME lacks rigor, she says, “The proof is in the pudding. The percentage of our graduates who got one of their top residency placements has always been higher than the national average.”

The program’s core values remain in place, and PLME students continue to enjoy a decidedly unconventional undergraduate experience. Smith’s daughter, Hilary Smith Jericho ’01 MD’06, concentrated in visual arts and studied abroad in Florence, Italy; now she’s assistant professor of pediatrics at the University of Chicago Pritzker School of Medicine.

“The kind of student attracted to the PLME is the same we’ve always attracted,” Smith says. “They’re committed to a career in medicine; they’re looking for a school where they’ll be given the opportunity to shape their own curriculum and do it in unique ways.”

And there’s no shortage of that type of student. In the current admission pool, Brown has received a record number of applications for the PLME: 2,915, a 22-percent increase over last year.

As a volunteer alumni interviewer, Anthony Lombardi ’89 MD’93, who practices internal medicine in Cranston, RI, requests PLME applicants so he can spread the good word. “I tell people that one of the biggest assets was the supportive, nurturing type of atmosphere,” he says. “It’s the ‘anything’s possible’ theory about Brown: if you want to do it, you probably can.”

“[The PLME] instilled a sense that people should not be just robotic in their approach to medicine.”

with that,” she says, and as chief of family medicine at Beth Israel Deaconess Hospital-Needham, “I’m not only concerned about life balance for myself but for my colleagues too. ... It’s important to me to have empathy.”


Garelick and Rossi, who began dating in their third year of med school and have a 14-year-old son, share values about achievement as well as quality of life. “We made our relationship with each other a huge priority,” Garelick says. “Is it because of PLME? Or because PLME attracted a certain type of person? Or did we just get lucky? I don’t know.”

Lee, now an anaesthesiologist in Virginia, says Brown prepared him to

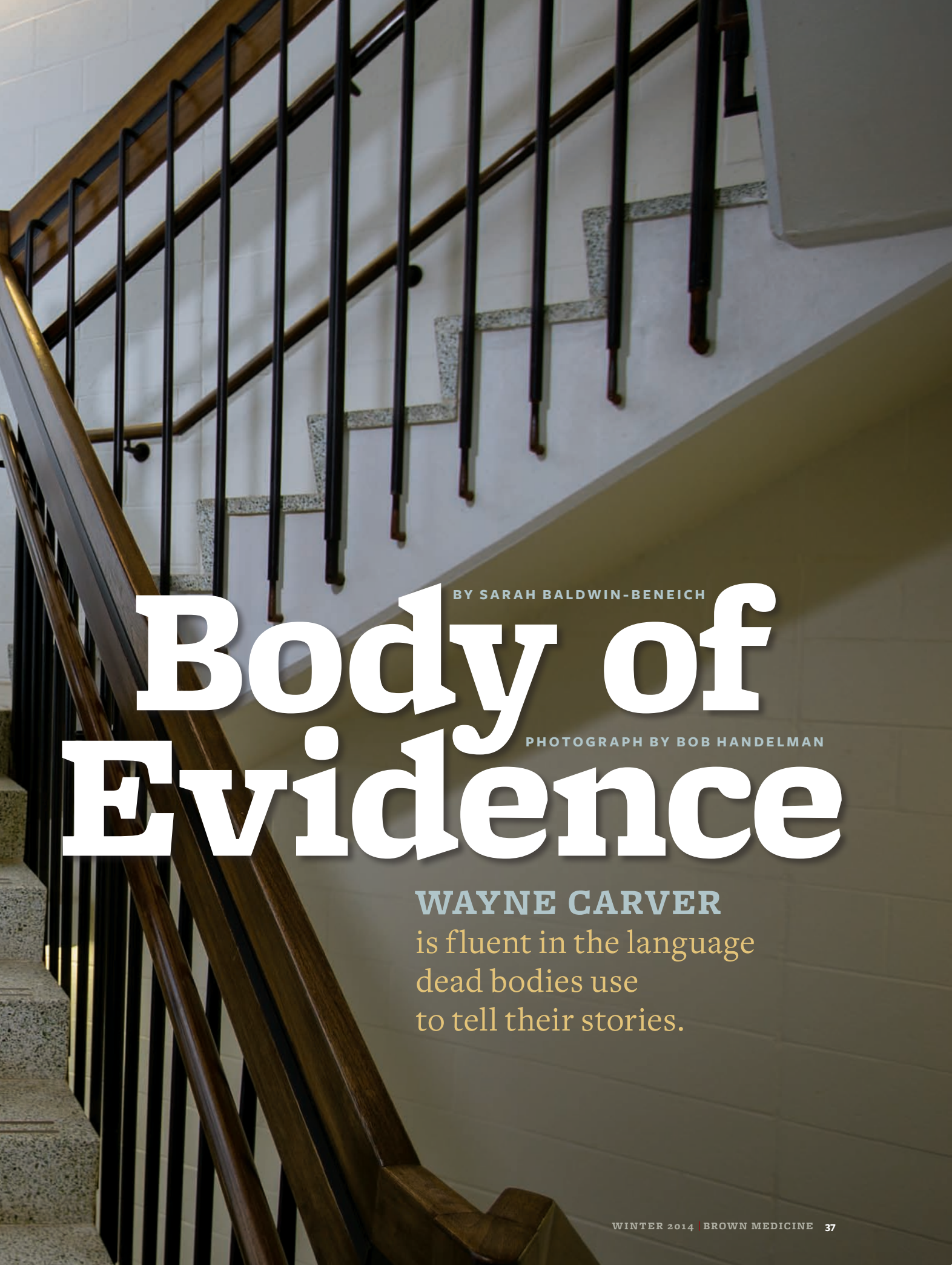
life,” says Yuan, a family doctor at the Eisner Pediatric & Family Medical Center in Los Angeles, which primarily serves low-income and uninsured patients. “I don’t think I realized at the time how different it was. I appreciate it now.”

ANYTHING’S POSSIBLE

Inevitably, the PLME has evolved over its three decades. The pre-med curriculum now requires more science so students are better prepared to share the classroom with others admitted to Alpert Medical School by the standard route. Ip offers a seminar to get seniors “back in the practice” of taking high-stakes, multiple-choice tests; the course

A full-page photograph of an older man with a white beard and glasses, standing on a stone staircase. He is wearing a black short-sleeved shirt with a colorful, repeating pattern of small, multi-colored circles. He is also wearing khaki trousers and dark brown leather shoes. He holds a cane with a colorful, repeating pattern of small, multi-colored circles. The staircase has a wooden handrail and a black metal railing. The background is a white brick wall.

TRUE TO LIFE
With his Hawaiian shirts and mischievous sense of humor, Wayne Carver, ME, strikes a balance between irreverence and solemnity.



BY SARAH BALDWIN-BENEICH

PHOTOGRAPH BY BOB HANDELMAN

Body of Evidence

WAYNE CARVER

is fluent in the language
dead bodies use
to tell their stories.

FOR A PLACE where more than a thousand human bodies a year are cut open and sewn shut, the Office of the Chief Medical Examiner (OCME) of the State of Connecticut is surprisingly unremarkable. Located in the wooded hills of Farmington less than 10 miles west of Hartford, it sits on a spur of the UConn Health Center, which is home to the University of Connecticut School of Medicine and Dentistry and which, like many US medical campuses, is composed of mismatched buildings separated by vast parking lots, with shuttle buses running among them. The OCME itself is simply too nondescript to seem macabre: a three-story, function-over-form, precast concrete bunker, it's pure Nineteen Eighties Municipal.

H. Wayne Carver II '74 MD'77, who recently concluded a 30-year career there—24 of them as chief medical examiner—arrives at the OCME with little fanfare but considerable presence. Four inches shy of seven feet and leaning on a long cane, he fills the doorway. His head seems to graze the ceiling, while his neck forms a sort of trapezoid with his shoulders. With his ring of white hair, he looks like a cross between Santa Claus and the Mont Blanc. Listing a little to the right, he walks through the lobby exchanging cheerful, casual greetings with the people who work there.

"How's it going, Doc?"

"We're gettin' there. How you doing?"

They gather around him like dolphins swimming with a ship, asking about cases, receiving instructions. At last he comes to his office. On the face of it, the windowless room seems ordinary enough: family photographs on the walls. Coffee mug, computer, and manila folders on the desk. Gradually, though, things that are not ordinary at all come into focus: a scallop shell filled with spent bullets, a framed x-ray of a pair of lungs, a giant animal skull the size of a toilet seat, a blue bomb like something Wile E. Coyote might order from Acme Bomb Supply, a microscope, an open bag of Hershey kisses, a plethora of masks—African, Asian, Oceanic, large and small, colorful and drab—displayed on walls

and tables and bookcases. On a shelf next to *The Whole Death Catalogue*, a six-pack of beer with homemade labels marked "R.I.P." And, beside the visitor's chair, a life-size effigy of what appears to be a warthog.

Carver lowers himself into his chair with a sigh and gestures toward the warthog. "Say hello to Mr. Pig."

DEATH is one of life's few inevitabilities, most often the terminus of disease or old age. And while such endings can be sad, they are not, medically speaking, mysterious. Then there are the deaths that nobody sees coming—the "violent, suspicious, or sudden unexpected" ones, according to the OCME's mission statement. These are the deaths that get Carver up in the morning and keep him up at night.

Violent, suspicious, sudden, unexpected: the adjectives cover a host of wrong turns and sad stories that might include drug overdose, child abuse, gunshot wounds, stillbirths, operating room mishaps, contagious diseases, criminal abortions, electrical or chemical injuries, traffic accidents. Homicides. Suicides.

In fact, all sudden and unexplained deaths (as well as any body to be cremated) under the age of 45 are subject to examination. ("It used to be 40," Carver deadpans, "but then I turned 40, so we moved it to 45.") These include both an infant who is said to have died from sudden infant death syndrome and an adult found dead at the foot of the stairs: did they fall, or simply have a heart attack at the bottom? There were more than 18,400 such reportable deaths in Connecticut in 2012; 1,382 of those resulted in autopsies.

According to Carver, 61, until his retirement, on May 1, 2013, he was the longest continuously sitting CME in the country. (Though officially retired as chief, Carver still works as a medical examiner for the state 120 days a year on contract.) He joined the office in 1982, and since then has performed or supervised approximately 7,000 autopsies on and testified in the cases of some of the most appallingly ravaged bodies in American memory: the eight female victims, aged 14 to 25, whom serial killer Michael Ross raped and murdered in Connecticut and New York in the early 1980s; Danish flight attendant Helle Crafts, whose body her pilot husband, Richard B. Crafts, dismembered and put through a woodchipper in 1986, in Newtown, CT; the wife and daughters of Dr. William Petit, after a home invasion in the town of Cheshire turned into a triple murder, in 2007; and, a little more than a year ago, the 20 children and six educators of Sandy Hook Elementary School, also in Newtown, as well as their assassin, Adam Lanza, and his mother, Nancy.

IT IS on the floor below Carver's office that this grimmer business is conducted. A body arrives in one of the OCME's three unmarked vehicles, which pulls up to a covered loading dock. It is then transported on a gurney down a narrow cinderblock hallway to the cooler. (When full, the cooler holds 37 cadavers and resembles an overcrowded recovery room in a hospital, except that the bodies on the gurneys are all in white bags, and none is waking up.) When it is time for a body to be identified, relatives can see it either up close, through a large window in an unfurnished, beige-walled viewing

room, or from afar, via closed-circuit television from the small "family room" upstairs, which contains a loveseat, two small armchairs, and a box of Kleenex.

A large door in the cooler leads to the autopsy suite, a chilly, cavernous room with a tan-colored tile floor and four stainless steel tables in a row at the far end. Here is where the body is photographed clothed and unclothed, and then wheeled to a table to be autopsied—"from first cut to last stitch, it takes the better part of an hour," says Carver. Organs are weighed, and samples are taken for histology and toxicology tests. The place is bathed in cold white light, and though not exactly dirty, it's not TV-show shiny, either. Every surface in the room is washable, so sounds ricochet. A faucet drips. An ordinary white refrigerator hums. The air is thick with a

samples are decanted, sealed in plastic bags, and placed in banker's boxes in the storage room next door, where they remain for five years. "We've got 7,500 dead people back there," says Carver.

Opposite the shelves is the x-ray room. Carver explains that x-rays are used to locate bullets, to look for occult injuries (most often in infants), and to identify an otherwise unidentifiable body. "Each time you identify a body, you're comparing some aspect of the cadaver to some record made during life," he says. "In the simplest paradigm, the aspect of the cadaver is the face, and the record made during life is someone's memory." But for cadavers without a recognizable face and without hands (and Carver says they get a fair number of those) they resort to x-rays of fillings, orthopedic hardware, even the wires used to close

The cooler holds 37 **CADAVERS** and resembles an overcrowded recovery room in a hospital.

sour smell that is both chemical and organic. Along one wall, shelves are stacked high with boxes of rape kits and FAA kits (for civilian plane crashes), a few large jars that contain fat brains awaiting examination by a neuropathologist, and dozens of smaller jars in which dull-colored chunks float in purplish liquid—a sample of each organ of each corpse pickling in formaldehyde, one person per jar. After six weeks, the

the sternum after open-heart surgery—each of these as individual as a fingerprint.

GIVEN the nature of his work, one could be forgiven for expecting Carver to be solemn, reserved, even doleful. Yet he is anything but: he is warm and funny, sometimes irreverent and mildly profane. ("This guy's got the liver from hell," he says, pointing at a lab

photo of a sick-looking yellowish-brown lump. “Lotta martinis in that one!”) He favors Hawaiian shirts and possesses many, which he orders from a woman named Judy in Yucca Valley, CA, who makes them; he has shirts featuring peace signs, turkeys, orchids, nautical maps, irises, rabbits, lobsters, pin-up girls, four-leaf clovers. He claims his

a flugelhorn, a 110-year-old cornet, a pocket trumpet. And now I have a stupid bugle.” Putting the horn to his lips, he squirts out a note and laughs. “It’s lousy!”

Carver’s affinity for music and performance can be traced back to his childhood in Skokie, IL, where he was a virtuoso tuba player. He continued playing at Brown, and spent his first three

Carver says with delight of the woman whose attentions he would pursue.

But their relationship hit a bump early on. Each year, Carver and his roommates threw a party before the start of classes. The rules: invite everyone you know, tell them to bring a bottle, and tell them to bring a friend with a bottle.

“Let’s say there was a lot of tequila,” Carver says. “I made an ass of myself. I spent the rest of that weekend worrying what would happen if [Debbie] never talked to me again, and she spent the rest of the weekend trying to find a new lab partner. She didn’t talk to me for three months.” Then, on December 10 that first year, the first night of Hanukkah, the two were invited to a latke party in West House. “We were the only goyim invited. And the only people not steady with someone else.” It was a set-up, and it worked. “We came separately and left together, and we’ve been together ever since.” Debbie went on to specialize in infectious diseases. The couple, who have two sons—Robert, 25, and James, 21—recently celebrated their 37th anniversary.

Carver was also influenced by BioMed professors Walter Quevedo, Frank Rothman, Elizabeth Leduc—as well as by Dean Aronson, a sort of father figure to him and who remains a good friend to this day. And there was Bill Sturner.

Why does a med student choose one specialty over another? “Hero worship of a professor,” says Carver. “In my case, it was William Q. Sturner,” then CME of Rhode Island. Though he didn’t initially opt for pathology, he says, “I remember standing on the patio at Andrews with Dr. Sturner and my parents. He put his arm around me and said to my mother,

“I spent **THE REST OF THAT WEEKEND WORRYING WHAT WOULD HAPPEN** if [Debbie] never talked to me again ...”

sense of humor didn’t evolve as a defense against the grimness of his work.

“I’ve always been like this,” he says. “A musician, an entertainer.” (Though he is clearly at ease speaking in public, some have criticized him for what appears to be a lack of solemnity. Tweeting at the press conference held after the Newtown killings, television personality Piers Morgan castigated Carver for what he interpreted as “totally inappropriate laughing, joking with media.”) As he talks, Carver takes an enormous Bowie knife from his desk drawer. The blade is two inches across and at least six inches long, the handle as big as a tennis racket’s. He uses the knife to cut through the packing tape on a brown package, from which he pulls what looks like a silver trumpet. He collects horns, he explains, just for the heck of it. “At home I’ve got an E-flat tuba, three trombones, a baritone,

years in the dancing tuba section of the Brown Band before becoming drum major his senior year. In 2011, he and 20 other band alumni donned skates and joined current members for an on-ice performance during the men’s hockey game against Harvard.

AT BROWN, where Carver arrived as a member of one of the pioneering classes of the nascent six-year medical program (he remains the only forensic pathologist to have graduated from the Medical School, according to Dean Stanley Aronson), he was to find more than an outlet for his musical talents. He would also meet people who would change the course of his life. One of the first was Deborah DeHertogh ’74 MD’77, whom he met in anatomy class in the fall of 1973.

“We shared the same cadaver!”



CENTER OF ATTENTION

On December 15, 2012, Carver talked to the media in Newtown, CT, after the Sandy Hook Elementary School shooting. Carver, the state's chief medical examiner, and his team conducted autopsies on the 20 children and six adults shot dead inside the school as well as on the gunman, Adam Lanza, and his mother, Nancy, whom Lanza had shot in her home. Carver took questions from the press, saying the carnage was "the worst I have seen."

"We got to him a little late, but I'm sure he'll be a good surgeon."

For his surgery residency, Carver returned to Illinois, to the University of Chicago's Billings Hospital. "I did a year and I hated it." This was on the South Side of Chicago in the eighties, he explains, at the height of the gang wars. "First of all, everybody died." And then there was the ruthless culture of the residency: "a total brutocracy." So he pursued his hero Sturmer's specialty, studying first anatomic and then forensic pathology. He loved it. "If you hit the books and worked hard, you were rewarded. As residents and fellows, we would give presentations ... take a topic and work it up. I still use my lectures on hypothermia, drowning, carbon monoxide, asphyxia, and more."

It was in Chicago, the "gunshot capital of the United States," according to Carver, that he also developed his extensive knowledge of gunshot wounds. For starters, he was no stranger to firearms. "During World War II my father was a weapons collector. He taught me all about them as a kid. I could fieldstrip an M1 carbine when I was 10 years old. Then I trained in Chicago. ... We had a thousand murders a year, most of them gunshots. We [residents] went in six days a week and often on the seventh day, too, just to see what was going on."

Carver eventually parlayed this expertise into his Gunshot Wound Lecture, covering the intricacies of such topics as entry and exit wounds, forensic ballistics, and bloodstain pattern analysis. "With a gunshot wound," he

says, adopting a professorial tone as though delivering the first lecture of Forensic Pathology 101, "what you want to establish at autopsy, aside from the usual cause of death and retrieval of bullets as evidence, is a very precise picture of the relationship between the decedent and the weapon. And that establishes the relationship between the decedent and the assailant. Including a very special case when the decedent is the assailant." He used to deliver the lecture, which consists of several hundred slides and can last three hours, as part of a weeklong shooting reconstruction course at the Henry C. Lee Institute for Forensic Science at the University of New Haven (named for its founder, another renowned forensic scientist) and elsewhere. The course's piece de résistance,

according to Carver, was a staged shoot-out with a car, after which they taught the students how to autopsy a vehicle.

“This is really cool,” he says, leaning forward and picking up a pen. “You got two gunshot wounds in a windshield.” On a scrap of paper he draws a small circle with zigzags radiating from it. A few inches away he draws another circle, then more zigzags, which stop when they reach the other zigzags at right angles. “What’s that tell you? When this gunshot cracked the windshield, this one was already here!”

“And the side windows, when they blow out, there’s always enough little pieces [of safety glass] left over that you can draw lines and figure out where the bullet went in. Worse comes to worst,” he adds mischievously, “you sweep it all up and make the interns put it back together.”

“Dr. Carver’s the perfect teacher, full of knowledge and a big believer in the ‘learn by doing’ method,” says Andy

could be emotionally taxing. Many of the victims were young and the majority looked much more alive than the cadavers I had seen in the anatomy lab. Dr. Carver often had interesting findings to point out: incidental tumors, signs of substance abuse, or hallmarks of mechanisms like hypothermia or drowning. It was especially interesting to hear him recreate homicides and accidents using clues on the dead.”

To scratch his pedagogical itch, Carver has several teaching gigs, including at Yale School of Medicine and UConn’s law and medical schools. And then there are the court appearances. “You’re teaching every time you’re in front of a jury,” he says. In 30 years, he has testified more than 600 times.

IT doesn’t take long to realize that Wayne Carver is as much sleuth as he is teacher. Not surprisingly, he has read four times through the complete Sherlock

produces a theory. In forensic pathology we have one test—the autopsy. I can’t take a history,” Carver says, “but I can rely on other people. It’s the same paradigm, the same code of honor binding him to the patient.” And like Holmes, if Carver delights in the process of discovery and deduction, what he really craves is the final explanation.

“Lemme show ya.” He turns to his computer—the screen saver scrolling across it says *Non sum applus regem* (“I am no longer king”)—and clicks through hundreds of photo files. “Elizabeth, where are you?” he says softly. “Ah, there she is.” He pulls up several images of what look like the results of an archeological dig: a jaw, some long bones, and a skull like an assembled jigsaw puzzle.

“This lady disappeared 24 years ago. Her husband went bankrupt and had to sell the farm. [Years later] the new owner’s tearing up the floorboards

“Many of the victims were young and the majority looked much MORE ALIVE THAN THE CADAVERS I HAD SEEN in the anatomy lab.”

Robin MD’13, who did an away elective at the Connecticut OCME in the fall of 2012. “At first, he walked me through autopsy protocol: how to stay safe, where to cut, what to look for, what to collect, and how to measure and store it. Soon, with his encouragement and guidance, I was performing autopsies myself. It

Holmes detective stories by Sir Arthur Conan Doyle—who was, Carver points out, himself a doctor. “Each story follows the classic model of an interaction with a physician. Someone approaches and says ‘I have a problem.’ Holmes undertakes to solve their problem. He develops a hypothesis, tests to see if it is sound, and

in the barn. Thirteen-year-old kid rummaging around says, ‘Dad, what’s this?’” Carver’s eyes twinkle. “It was a femur!”

Pointing to the image of the crazed skull, he continues: “She got mashed up good here. You can see the outer layer of bone has been crushed. She’s been hit with something substantial.” After a

short lesson on so-called “bumper fractures” (in which the nature of breakage of the tibia can reveal clues about the vehicle that collided with it) he indicates the V-shaped fracture of her ulna (which reveals clues about the heavy object that collided with her forearm). “This is what we call a defense injury. You can look at these and say, ‘Why do we know she was alive when she got [hit]?’ Because we know she was conscious enough to put up her arm to protect herself.” He pushes away from his desk and leans back, stretching his legs under his desk. His feet, in boat shoes with no socks despite the raw November day, poke out the other side. He opens his arms wide and grins. “Is that cool or what? Why do you think I love this stuff?”

Of course, not every mystery can be solved, and that confounds him. According to the OCME’s statistics for 2012, cause of death was “undetermined” in 52 cases. “About 1 percent of the time you don’t figure out cause of death,” he says. “What you do is, you keep ignoring it ... so you don’t have to admit defeat.”

ALTHOUGH Carver sees the worst of what people do to each other and themselves, “he’s never let the darkness make him dour,” Robin says. Indeed, when asked about the cheerful notes taped to the walls here and there (“Always place bodies on high stretcher. Thank you! ☺” and “Do not remove this plank—Thanks! ☺”), Carver explains, “We have compensation mechanisms: humor and petty feuds. But when the shit hits the fan, the latter goes away.”

The latter went away on December 14, 2012, when the Sandy Hook dead arrived. Carver had announced his

resignation, with five months’ notice, as CME less than two weeks before. At the time, he described the carnage as “devastating ... the worst I have seen.” “We had nine technicians, four doctors, two photographers, and some x-ray people the day after Sandy Hook,” he recalls now. “We did 26 autopsies in one day.”

Asked if some of the cases—Newtown among them—keep him awake, he

occurred, was moved by the way Carver led his team during the aftermath. “He exudes a love of life, people, food, history, music, humor, and trivia, which was a wonderful thing for his staff. He helped them stay positive and proud of the work they do.”

It’s easy to overlook the fact that Wayne Carver, ME, also serves the living, that he is a physician who helps people

“My wife told me that for two months after Sandy Hook I’D SCREAM in the middle of the night. I never knew it.”

tries for a laugh. “Between my prostate and my sleep apnea....” He stops, sighs. “I don’t know.” There is a silence. Then he adds softly, “What can I say? Yes, sometimes it gets to you. Every five years I’ll break out of a case and go sit in the locker room and cry. But not every day. My wife told me that for two months after Sandy Hook I’d scream in the middle of the night. I never knew it. But that’s what she said.” Last December, just days before the one-year anniversary of Lanza’s killing spree, he heard on the car radio that a college student armed with handguns and an assault rifle had been arrested on the University of New Haven campus. Carver pulled over to the side of the road, put his head in his hands, and wept.

Robin, who was working his final week when the Sandy Hook shootings

the way other doctors, the kind who deal with live patients, help people. “All deaths cause problems,” he says. “Some deaths cause more problems. Our job is to supply the information people need to solve these problems.

“If it was just done, it wouldn’t matter,” he continues. “People need something from us. ... That’s what a physician does. People come to us with problems, and I use my skills to help them. This is my calling. I’m good at this.” He pauses and says quietly, “I help people. I don’t make things better. But sometimes I make them less bad.”

Sarah Baldwin-Beneich ’87 is the director of communications at the Watson Institute for International Studies at Brown. She was previously the editor of Brown Medicine. photo of a sick-look-

ALUMNI ALBUM

CHECKING IN WITH BROWN MEDICAL ALUMNI



FIVE YEARS ALREADY?!
Believe it or not, it's already time
for the MD Class of 2009's
five-year reunion. Round up your
friends and meet in Providence
this Memorial Day weekend.

PLEASE SHARE.

Career news, weddings, births—
your classmates want to know.
Go to med.brown.edu/alumni
and click on “**Updates and
Class Notes.**”

CLASSNOTES

ALUMNI

1975

Mark S. Blumenkranz '72 MMS'76,
P'05, '08 delivered the Jackson Memorial
Lecture in November at the 2013 annual

meeting of the American Academy of
Ophthalmology in New Orleans. His
lecture, “The History and Evolution of
Lasers in Ophthalmology: A Review of
the Interactions Between Physicians,
Patients and Photons,” will be published
in the *American Journal of Ophthalmol-
ogy*. Mark is chairman of the Depart-
ment of Ophthalmology and director of
the Byers Eye Institute at Stanford. He's

HANK RANDALL

also a Fellow of the Corporation of Brown University and chairs the Medical School Committee.

1977

H. Wayne Carver II '74, who in 1986 became the youngest chief state medical examiner in the country, retired in May 2013 after 31 years of service to the state of Connecticut. Read more about Wayne and his career in the feature story starting on page 36.

1978

John Pandiscio '75, P'01 was married to Sandra M. Widdall on May 26, 2013, at Nashawtuc Country Club in Concord, MA. John is a family doctor in Hopkinton, MA.

1979

Susan Hyman '76 spoke at a conference on autism in New Delhi, India, last year with her Brown roommate Karen Margulis London '76. Susan is a professor of pediatrics at the University of Rochester Medical Center School of Medicine and Dentistry and the division chief of Neurodevelopmental and Behavioral Pediatrics at Golisano Children's Hospital in Rochester, NY. She chairs the American Academy of Pediatrics subcommittee on autism. After the conference, she traveled in northern India with her husband, William Fricke, MD, and Karen and her husband. In May 2012, Susan and Karen celebrated the graduation of their daughters, Allison and Rachel, from Washington University in St. Louis; like their moms, they were roommates for three years.

Daniel Harrop '76 RES'83 commissioned a redesign of his home for which the architecture and interior design firms won a gold award in *Rhode Island Monthly's* 2013 Design awards. The magazine described Dan's home on the East Side of Providence, where he has lived for



EYE ON ALUMNI

The Need for Speed

Retirement provides time for a victory lap.

Preston Calvert '76 MD'79 says it's not what you drive, it's how you drive it.

As a student he toiled around Providence in a Ford Pinto and rode dirt bikes after class with Moses Goddard '76 MD'79. He's traded up since then, parking a new Porsche 911 Turbo and a Ducati Panigale sport bike in the garage of his Potomac, MD, home. But he's most excited about the Corvette Grand Sport and Mustang Boss 302R he's racing on tracks throughout the country—and racing well, too, by some accounts.

The neurologist and neuro-ophthalmologist, who left clinical practice in 2010, had no plans to slow down in retirement. "I don't play golf," he says. At the suggestion of his wife, Margaret Guerin-Calvert '76, he took a performance driving course four years ago and was hooked.

"I always enjoyed high-performance cars, but I had no particular extra skill at driving them," says Calvert, 58. Yet at his second driving course, a year later, he clocked the second-fastest lap time in a field of more than a dozen people. "It shocked me I could do things like that," he says. "I thought, maybe I've got a little aptitude for this."

With the full support of his wife ("I kid people that I think Meg is trying to kill me," he says), Calvert entered his first amateur race in the summer of 2012. "I was one of slowest guys, but I got the bug," he says. Months later he bought his first race car, a 2010 Corvette GS, and went on to garner several second- and third-place finishes in SCCA Majors level races in 2013—qualifying him for the SCCA National Championship Runoffs in Elkhart Lake, WI, in September. *(Continued on the next page)*

ALUMNIALBUM

EYE ON ALUMNI

(Continued from the previous page)

"Everyone in SCCA is racing for little tiny plastic trophies. There's no money in this," he laughs. "It's really a crazy thing." After posting the second-fastest qualifying time for the championship race, Calvert earned a front-row start, but an electronic failure forced him to make a pit stop

"I don't want to get hurt, but I'm
inherently a risk taker."

and he finished eighth. "I was a rookie running with the big boys," he says. "I chalked it up to experience. It really got me eager to do more."

Calvert has also begun racing a Ford Mustang Boss 302R in the GS class of the professional IMSA Continental Tire Sports Car Challenge series, which pits him against some of the best young drivers in the country in a highly competitive developmental race series. He plans to compete in a full schedule of 2014 amateur SCCA Majors races in his Corvette, too.

It's not all play and no work for Calvert. He still sits on the faculty of the Johns Hopkins School of Medicine and he's past president and current board chair of the North American Neuro-Ophthalmology Society. He's also president-elect of the Brown Medical Alumni Association Board of Directors.

Before he could jump into a full schedule of professional racing this year, however, Calvert had another battle to fight. Last August he was diagnosed with early-stage kidney cancer; two days after his final race of the 2013 season, it was removed. The experience "reinforced for me the brevity of life," he says, "and that you should take advantage of opportunities, live in the moment as much as you can—within the confines of prudence."

He takes care that his racing won't assure his life's brevity. "I don't want to get hurt," Calvert says, "but I'm inherently a risk taker." He describes his approach to driving as cautious and analytical—and draws parallels to how he worked as a physician. The passion, work ethic, and communication skills that served him well in his first career are helping him find success in his new one, he adds.

"I love medicine, but I always had many other interests and I had the opportunity to pursue some of those," he says. "I'm having way too much fun."

—Phoebe Hall

30 years, as "overly cozy" before he hired professionals to update the interior. Now his award-winning home is "fresh, yet personal," according to *Rhode Island Monthly*, combining favorite decorations with a new aesthetic. Dan is a psychiatrist in private practice in Providence and a member of the Brown Medical Alumni Association Board of Directors.

1980

Mark Nunlist '70 was named Physician of the Year by the Vermont Medical Society for "skillful and compassionate patient care ... in accordance with accepted principles of good medical practice," the society said in its award letter. In addition Mark's practice, White River Family Practice, received an Ambulatory HIMSS Davies Award of Excellence for 2013, recognizing exemplary implementation and use of electronic health records and other health information technology to improve the quality of care provided to individual patients as well as patient populations. Mark received an MS in health care leadership from The Dartmouth Institute for Health Policy and Clinical Practice in 2010, and has been developing his practice as a clinical micro-system in primary care delivery.

1981

Andrew Wilner published *Bullets and Brains*, a collection of more than 100 essays about the brain that focus on the intersection of neurology and society. A neurohospitalist and journalist, he writes regularly for *medscape.com* and has written two books on epilepsy. He lives in Fall River, MA.

1982

Jay Loeffler was appointed to the Medical Advisory Board of Advanced Onco-

EYE

ON ALUMNI

Mindless Neuroscience

Did your brain make you do it?

Humankind has such a yearning to understand what's going on in the black box of the brain that there's a rush to embrace technologies that might illuminate it. Functional magnetic resonance imaging (fMRI) studies of the brain show colorful pictures of regional brain activity when mothers look at babies, the hungry contemplate food, or a photograph of a Maserati is put in front of a male consumer. But fMRI isn't ready for prime time, psychiatrist Sally Satel MD'84 cautions in her latest book, *Brainwashed: The Seductive Appeal of Mindless Neuroscience* (Basic Books, a division of the Perseus Books Group, New York), co-authored with psychologist Scott O. Lilienfeld.

Satel has great respect for the capabilities of fMRI and for the researchers who conduct rigorous scientific research in the field, but a combination of forces—defense attorneys, entrepreneurs, some neuroscientists, and an eager public—are pushing this tool prematurely into applications where the conclusions drawn from it are not only inaccurate, but potentially harmful.

fMRI is creating the basis for neuromarketing firms to help product companies influence consumer behavior (and for trial lawyers to find the crime in that), and it's making its way into the criminal justice system, to document accountability or detect lying. In medicine the findings from fMRI underpin treatment strategies. But its use in these applications isn't supported—yet—by brain-based data.

"Years from now we will be undoubtedly more skilled at un-

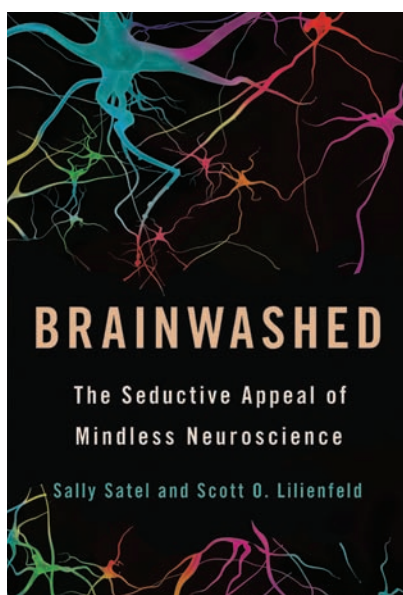
derstanding the mechanisms of everything that we consider to be psychological processes: emotion, decision-making, memory, impulse control, reasoning, and planning," Satel says. "But today, while we see what is going on in the brain as we see these [actions] happen and we have a lot of neuro-correlates, we can't come up with complete causal stories."

Take addiction research, one of Satel's areas of expertise. (After Brown, Satel did her residency in psychiatry at Yale School of Medicine with a focus on drug addiction.) fMRI has been used to affirm the notion of addiction as a chronic and relapsing disease of the brain, over which a patient has no more control than brain cancer. "There is no question that drug dependence is linked to brain changes. The question is whether those changes prevent the addict from responding to rewards, sanctions, and reasons. They don't; not in the same way that the brain changes of Alzheimer's or Parkinson's

disease lead to uncontrollable alterations in cognition and behavior." Referring to addiction as "a brain disease" is not only a misleading public health message, says Satel, but in her opinion, this flawed hypothesis influences treatment strategies and the funding of new treatments such that incentives and other effective tools of behavioral modification might not be considered.

Satel is a resident scholar at the American Enterprise Institute in Washington, DC, and she practices psychiatry at a methadone clinic. *Brainwashed* is her fifth book.

—Mary Stuart



ALUMNIALBUM

therapy, which focuses on providing new technology for cancer treatments. Jay will work with investigators trained by the European Organization for Nuclear Research to increase access to proton therapy by developing inexpensive accelerators. Jay is the Herman and Joan Suit Professor of Radiation Oncology at Harvard Medical School and chair of the Department of Radiation Oncology at Massachusetts General Hospital.

1984

Sally Satel, a scholar at the American Enterprise Institute, and Scott O. Lilienfeld published *Brainwashed: The Seductive Appeal of Mindless Neuroscience* in June (see page 47). Sally is the staff psychiatrist at the Oasis Clinic in Washington, DC, and the author of several books and articles on topics in psychiatry and medicine.

1987

Arthur J. Vayer '84 was named vice speaker of the Medical Society of Virginia (MSV) in October. Arthur is a board-certified general surgeon at Sentara Surgery Specialists in Northern Virginia. He has also served as a delegate and associate director for MSV, in various officer positions with the Prince William County Medical Society, as a member of several committees at Potomac Hospital, and as chair of the perfor-

mance evaluation committee for Sentara Northern Virginia Medical Center.

1988

Eric Sievers '85 was promoted to senior vice president of clinical development at Seattle Genetics. Eric joined the biotechnology company in July 2006 and helped lead clinical trial efforts that resulted in the 2011 FDA approval of AD-CETRIS, an antibody-drug conjugate for patients with advanced Hodgkin lymphoma and systemic anaplastic large cell lymphoma. Eric directs, plans,

Dallas Medical Center. He and his wife of 22 years, Shemara, a couture fashion designer, have three children: Shehan, 19, Prashan, 16, and Shara, 12. "Life is crazy with a busy surgical practice and having to keep fashionable through it all!"

1992

Richard R. DeMaio joined the staff of Hudson Valley Ambulatory Surgery in Wallkill, NY. A board-certified otolaryngologist and head and neck surgeon, Richard specializes in pediatric otolaryngology, endoscopic sinus surgery, and

"Life is crazy with a busy surgical practice and having to keep fashionable through it all!"

and executes clinical trials for antibody-drug conjugates to address unmet needs in acute leukemias, lymphomas, and a variety of solid tumors.

1989

Helen Chen '85 is the chief medical officer of Hebrew SeniorLife Health Care Services and Hebrew Rehabilitation Center in Boston. She also serves as senior clinical adviser and oversees the organization's Department of Medicine. Previously, Helen was the chief medical officer at the Center for Elders' Independence in Oakland, CA. She is a clinical professor of medicine at the University of California, San Francisco, and is board certified in geriatrics, internal medicine, and hospice and palliative medicine.

D. Rohan Jeyarajah '86 is the director of surgical oncology and director of the HPB fellowship program at Methodist

obstructive sleep apnea and snoring surgery. He completed his general surgery internship and residency in otolaryngology at the University of Rochester and was a surgical research fellow and clinical fellow at the Brigham and Women's Hospital, Strome Laboratory, and Harvard Medical School, where he was involved in laryngeal transplantation studies.

1993

Robert Pierce is the chief medical officer of OncoSec Medical Inc., a San Diego-based company that is developing DNA-based immunotherapy to treat solid tumors. Rob, who researches mechanisms of immune tolerance, previously worked at Merck Research Labs in Palo Alto, where he led a drug development team and served as a discovery project team leader for two novel drug candidates. Prior to joining Merck, he held leader-

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EYE ON ALUMNI

The Person Not the Parts

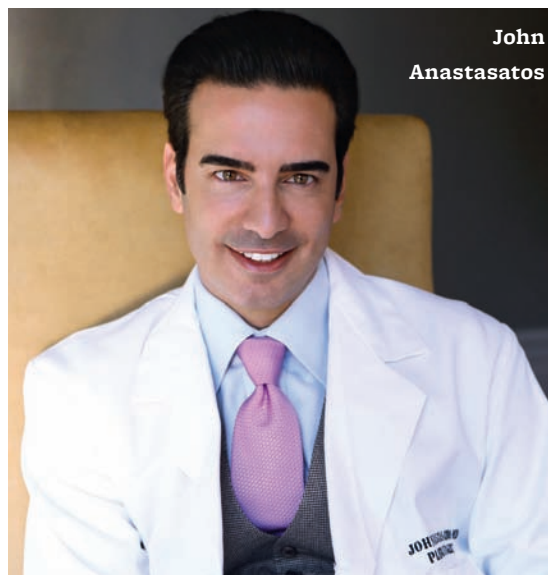
The benefits of plastic surgery are more than skin deep.

John Anastasatos '92 MD'96 always knew he wanted to be a surgeon. Summers during high school, he shadowed a vascular surgeon and by the time he entered the Program in Liberal Medical Education at Brown he says he had participated in more than 30 major vascular surgery operations. Today Anastasatos is a board-certified plastic surgeon practicing in Beverly Hills, and two months out of the year, in Athens, Greece. The bulk of his practice is cosmetic plastic surgery, but he also performs reconstructive surgery and hand microsurgery.

Brown's focus on patient-centered care appealed to Anastasatos. "Brown has been at the forefront of providing high-end and specialized care, but at the same time, the patient is not lost to statistics, tests, and biology. The patient is an individual and should be treated that way."

That emphasis on the individual is essential since the outcomes of cosmetic surgery are subjective. "A carotid artery repair has an objective outcome. But the outcome for aesthetic plastic surgery depends on how the patient sees it." In practice for 11 years, Anastasatos says a turning point came three or four years ago. "I had done so many operations and sometimes I felt that the outcome was perfect; I had done the best job that could be done, yet the patient was not completely satisfied. Other times I would appraise my work and feel that I could have done a little bit better, but the patient was ecstatic with the results." Now, says Anastasatos, the most important part of the procedure is the pre-operative consultation. "The more you listen, the more you understand. If you create a rapport, things just go better."

Working in Beverly Hills and Athens doesn't sound like a bad gig, but Anastasatos insists that there is a duality in his profession. Plastic surgery combines both wants and needs; on one hand, rejuvenation or enhance-



ment procedures improve a patient's quality of life, on the other, cancer-related reconstructions and the repair of facial and hand fractures and burns are necessary to the health of a patient. Sometimes plastic surgery can even save lives.

Take Luz Gonzalez, a single mother in LA who was the victim of a random shooting on her way to work one morning. Shot in the face seven times, her odds of surviving were low. Though she lived, she wasn't out of danger, Anastasatos says. There was so much trauma and scarring to her face that her jaws and muscles were frozen. She couldn't open her mouth to eat. She couldn't brush her teeth and was losing them. She had already lost one of her eyes and couldn't close the other one. "She weighed less than 80 pounds when she came to see me," says Anastasatos.

Several plastic surgeons had already concluded that nothing could be done for Gonzalez, but Anastasatos took on the challenge. Working with the Victim Assistance Program of the Los Angeles District Attorney's office, Anastasatos operated on her for three years. First, he performed a series of minimally invasive procedures to help open Gonzalez's mouth so she could eat. When she became healthy enough for surgery, he performed two major operations to reconstruct her face.

"She lives a normal, happy life now," he says. "That will always be one of my most gratifying experiences."

—M.S.

ALUMNIALBUM

ship positions at the University of Rochester School of Medicine, was staff pathologist, developed the graduate curriculum in pathomechanism of disease, and was principal investigator of an RO1-funded research lab; he continues to serve as an adjunct professor there. He and his wife, Anja Wiedemann Pierce '95, have two children.

1995

Preetha Basaviah '91 was appointed assistant dean for pre-clerkship education at Stanford School of Medicine, where she began working in 2006 as Practice of Medicine course director. She is also clinical associate professor of medicine and one of the founding members of Edu-

Leslie received last year's Brown Medical Alumni Association Early Achiever Award for identifying the gene that causes progeria and developing the first-ever treatment for the disease. Leslie and Scott started The Progeria Research Foundation shortly after Sam was diagnosed.

Myechia Minter-Jordan '94 was named to the Boston Foundation board of directors. The foundation cited her leadership in increasing access to health care for "the city's most vulnerable residents" as an important factor in her nomination. Myechia is president and CEO of the Dimock Center, a community health center in Roxbury, MA. She lives in West Roxbury with her husband, Larry, and their two young daughters.

Sam was the subject of the HBO documentary *Life According to Sam*.

cators for CARE. Preetha completed her residency, chief residency work, and a medical education fellowship at Harvard. She then was a hospitalist at Beth Israel Deaconess Medical Center before codirecting doctoring courses and working as a hospitalist at University of California, San Francisco. She is a member of the Brown Medical Alumni Association Board of Directors.

1998

Leslie Gordon ScM'91 PhD'98 and her husband, Scott Berns, MD, clinical professor of pediatrics at Alpert Medical School, mourn the loss of their son, Sam, 17, on January 10 from complications of progeria. In recent years Sam had become the public face of the early-aging disease and was the subject of the HBO documentary *Life According to Sam*.

1999

Graham Gardner, MBA '95, co-founder and CEO of Kyruus Inc., a health care big data company, will partner with athenahealth Inc., which provides cloud-based services for electronic health records. Kyruus will collaborate with athenahealth's network of about 44,000 providers to optimize the matching of patients with specialists.

2003

Zachary N. Litvack '98 was featured in the October 2013 issue of *The Washingtonian* for his work with minimally invasive brain procedures at George Washington University Hospital. Zachary is one of the few doctors in the US who can perform a single-port intracranial endoscopy, in which he drills a nickel-size

hole into the skull in order to view and remove tumors. "The idea is to minimize the manipulation and trauma," he told the magazine, "and let patients return to a better quality of life." Zachary lives in Washington, DC, with his wife, Jamie, and their two young daughters.

2004

Shimae Cross Fitzgibbons '99 and **Peter Fitzgibbons** RES'09 F'10 joined MedStar Georgetown University Hospital in 2012. Shimae is an attending general surgeon in the Department of Surgery and Peter is a hand surgeon in the MedStar Georgetown Orthopedic Institute. They live in Washington, DC, with their two children.

FELLOWS

2013

Philip Formica, MD F'13 has joined Southcoast Cardiology, part of the Southcoast Health System, in Fairhaven, MA. Formica received his MD from Boston University School of Medicine and completed residency in internal medicine at New York University Medical Center. He completed his fellowship in cardiovascular disease at Alpert Medical School.

Stephanie Sippel Midgley, MD F'13 was named director of ultrasound medicine at Eos Medical Group in Fishkill, NY. A member of the American College of Emergency Physicians and the Society for Academic Emergency Medicine, she serves as an instructor in emergency ultrasound and critical care ultrasound. Stephanie completed her emergency medicine residency and ultrasound fellowship at Alpert Medical School, where she was a clinical teaching fellow. She earned her medical degree at SUNY Downstate Medical Center.

OBITUARIES

ALUMNA

JULIE W. COLLITON MD'90

Julie Colliton, 50, of Breckenridge, CO, died August 16, 2013, after a long battle with anorexia. A rehabilitation physician originally from Newton, MA, she moved to Colorado to set up a medical practice in Summit County. Julie leaves her daughter, Orla Eisenberg, and Orla's father, Rick Eisenberg, of Boulder, CO; and three sisters. Donations can be made to US Paralympics, with a memo line "Paralympic Ski Team for J. Colliton," and mailed to US Olympic Committee, Attn: Development, One Olympic Plaza, Colorado Springs, CO 80909.

RESIDENT

VAHEY M. PAHIGIAN, MD RES'51

Vahey M. Pahigian, 95, of Providence, RI, died October 17, 2013. Before retiring in early 2013, he ran his own private physician practice. He was the former chief of general surgery at Women & Infants Hospital and consulting surgeon at Rhode Island Hospital. Born in Lowell, MA, Vahey attended the University of Rhode Island and Tufts University School of Medicine, then completed his residency in general surgery at Brown. He served in the 3rd Army Medical Corps during World War II as a field-hospital surgeon. Vahey was predeceased by his wife, Elizabeth, and his sister; he is survived by his children, Beth and Craig. Contributions can be made to Sts. Sahag & Mesrob Church, 70 Jefferson St., Providence, RI 02908.

FACULTY

GEORGE K. BOYD, MD

George K. Boyd, 84, of Barrington, RI, died September 30, 2013. A clinical associate professor emeritus of pediatrics at

Alpert Medical School, he was a practicing pediatric allergist for 35 years. The Lawrence, MA, native graduated from Tufts College and Boston University School of Medicine and served as a Navy medical officer on a destroyer in the Pacific. He trained Brown medical residents at Rhode Island Hospital, where he specialized in pediatric allergies, and helped thousands of children breathe easier. George is survived by his wife, Jean; their daughters, Gayle Sommer and Sharyn Klaiman; and two grandsons. Donations can be made to the New England chapter of the Asthma and Allergy Foundation of America at www.asthmaandallergies.org or to Home & Hospice Care of Rhode Island at www.hhcri.org.

MAXIM J. DAAMEN, MD

Maxim J. Daamen, 65, died September 29, 2013. He joined Brown's Department of Psychiatry and Human Behavior in 1977, where he was a clinical associate

professor. Born in the Netherlands, he moved with his family to Vermont when he was 12. He earned his bachelor's degree at the Massachusetts Institute of Technology and his medical degree from Tufts University School of Medicine. At Brown, Maxim led affinity groups for the Program in Liberal Medical Education, was acting associate dean of the college for sophomores in 1986, and was director of group training for the psychiatry residency program from 1995 to 2011. He also served on the departmental Clinical Faculty Appointments and Promotions Committee for many years. Maxim maintained a private practice on the East Side of Providence and was recognized for several years by *Rhode Island Monthly* as one of the state's top psychiatrists. He is survived by his six older siblings and 13 nieces and nephews. Contributions can be made to the Rhode Island Foundation, Maxim Daamen Fund, One Union Station, Providence, RI 02903.



Maxim J. Daamen in 1986

MOMENTUM

A Beautiful Mind

A new gift expands the possibilities for brain research.

Considerable individual charity is sometimes underscored by a humble conviction: that the momentum of the cause is much greater than the gift. Pablo J. Salame '88, who established an assistant professorship within the Brown Institute for Brain Science (BIBS), epitomizes this idea. "The work BIBS is doing is so compelling that they would have found someone else to support it quickly anyway," he says. "In some ways I feel lucky to have found them."

The forward movement of the Brown Institute for Brain Science, and of brain research broadly, is indeed prodigious. Universities and hospitals increasingly focus on the brain as one of the most complex, and potentially transformational, areas of scientific inquiry. New state-of-the-art tools are advancing this work at a rapid pace. And through carefully curated expertise and the close collaborations for which the University is known, Brown is at the movement's forefront.

But scientific advancement requires support, perhaps especially when it is most promising. Awarded to Wilson Truccolo, PhD, the Pablo J. Salame '88 Goldman Sachs Assistant Professorship in Computational Neuroscience will help ensure such growth. Truccolo is an "internationally recognized computational neuroscientist," says Henry Merritt Wriston Professor of Neuroscience John Donoghue PhD'80, P'09, '12MD'16, the

institute's director. His work will help BIBS advance its unique interdisciplinary study of brain function, Donoghue says; and it "will beautifully complement the experimental neurobiology that our Department of Neuroscience already excels in," adds L. Herbert Ballou University Professor of Neuroscience Barry Connors, PhD P'07, the department's chair.

Computational neuroscientists study and model the collective actions of billions of neurons that generate our perceptions, thoughts, and behaviors. "Computational neuroscience is essential for providing a mathematical framework for understanding brain science data and devising new experiments," says R. John Davenport, PhD, associate director of BIBS.

Research in this area is also primed for translation—a focus for BIBS, which is not only working to understand the brain, but also to develop new therapeutic interventions for abnormal brain activity. Computational neuroscience "provides a unique opportunity to detect pathological activity and to intervene using engineering methods," says

Michael Frank, PhD, associate professor of psychology and cognitive and linguistic sciences. For example, recent studies have shown that neuromodulation-based therapies such as deep brain stimulation—already commonly used to treat Parkinson's disease—are very promising in the treatment of various neurological and psychiatric conditions.

Truccolo says that a major focus of his research is, indeed, the development of computational neural models for use in medical applications. His lab is focused on mathematical and statistical models for predicting and controlling epileptic seizures. A long-term goal of this work, he says, is to develop new neuromodulation therapies for epilepsy and other neurological or neuropsychiatric disorders. In addition, Truccolo says that computational neuroscience models are

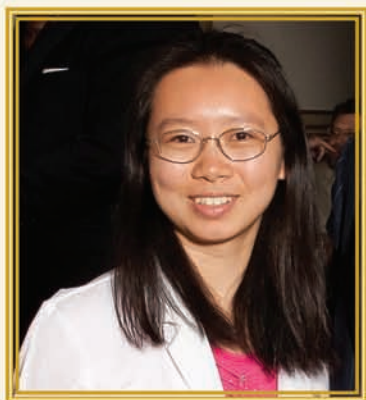
"Some of the **work being done at Brown** would have **seemed like science fiction** not long ago."

needed to read and write neural codes in brain-machine interfaces that aim to restore movement and communication in people with paralysis—an area in which Brown is a world leader.

Salame, who earned his ScB in applied math and economics from Brown, believes in both the practical and humanistic possibility of this research, citing the potential for the University to develop intellectual property while advancing the human condition. But that which can't be seen or predicted, he says, is its ultimate promise. "Some of the work being done at Brown would have seemed like science fiction not long ago," he says. "The application of this research 40 years down the line is unimaginable by most today." —Kylah Goodfellow Klinge

Announcing...

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— ALICE CHUANG '11 MD'15

Scholarly Concentrations like Alice's are one of the highest-priority areas supported by the Brown Medical Annual Fund. With a gift of \$10,000 or more annually, you can create a Dean's Circle Grant and direct your gift to one of these areas — and connect directly with the good work your gift makes possible.

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Questions? Contact Bethany Solomon, director of the Brown Medical Annual Fund, at Bethany_Solomon@brown.edu or (401) 863-1635.



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