

BROWN MEDICINE

Volume 19 | Number 3 | Fall 2013

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A NEW DEAN
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GUT FEELINGS
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BRAIN STORM

Some of the
best minds
at Brown are
tackling
concussions.

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A Warm Welcome

I'm pleased to be writing my first Dean's Letter in *Brown Medicine*. I have been in the position for slightly less than a month and am happy to share my first impressions with you in this issue.

So far, my family and I are enjoying Providence very much. It is filled with warm people, unique neighborhoods, and an amazing array of restaurants. In true Rhode Island fashion, we have even run into friends we knew back in high school in Pennsylvania around town. This is an interesting place with its own way of doing things, and my wife and I are learning the Rhode Island way. I am well on my way to getting around town without my GPS.

One of the wonderful things about what we do is the ability to influence and help young people. College, medical school, and graduate school are times where one gains a factual data set in an area of interest. Importantly, they are also times when one gets to discover his/her passion. My wanderings during the last three weeks at Brown have left me impressed by the breadth and depth of expertise of our faculty and alumni and their commitment to the teaching and passion acquisition of our students. I have enjoyed meeting many members of our extended community and hearing what motivates them.

I hope you'll enjoy this issue of *Brown Medicine*. Thank you for welcoming me and my family to this community. I look forward to working with you in the future.

Sincerely,

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

Jack A. Elias, MD



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“We’re still trying to define concussion. It can be a very elusive phenomenon.”

—Lisa Merck, MD Page 28

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BY KRIS CAMBRA

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BY PHOEBE HALL

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BY CHRISTINE MONTROSS MD’06
MMS’07 RES’10

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Cover: Alyssa Blood ’11 photographed in Aurora, CO, by Karen Philippi.



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It Could Be Worse

I won't lie: things have been stressful around here lately. Another issue of the magazine to put together, the communication needs of a new dean, the flurry of events and happenings of a new school year, not to mention the work of running home and hearth ... all of it has been, well, a little overwhelming.

Contemplating the stories in this issue, though, gave me new perspective. My worst, no-good, very bad day pales in comparison to a doctor's worst day. The day a patient commits suicide, despite your attempts to save him. The day a patient leaves the hospital so that she can die at home. The day you realize you are helpless in the face of insidious illnesses. Those kinds of problems make mine feel inconsequential.

I'm awed, still, that mere mortals willingly take on that responsibility to "bear the weight of the living," as our Resident Expert poignantly puts it. Physicians are there in the darkest hours, and even when they feel they have nothing to offer a patient, sometimes just their presence brings comfort and healing.

Sometimes just knowing you are not alone is all the medicine you need.



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INBOX

DANGEROUS INHERITANCE

I applaud *Brown Medicine* for recognizing a national crisis in this country, namely opioid dependence and addiction (Spring 2013). As a neonatologist, not a week goes by that I don't encounter the most vulnerable of dyads, a mother and her infant faced with the consequences of opioid dependence. While the recommended maternal treatment strategy is maintenance therapy with either methadone or buprenorphine, the majority of infants require a prolonged hospital stay receiving medication for withdrawal. Many mothers, particularly those misusing prescription narcotics unbeknownst to family and friends, have no idea about the fetal and ulti-

mately neonatal effects of their misuse and are faced with this realization when it becomes clear their baby will not be ready to go home with them.

As physicians we are privileged to care for others who seek our expertise. Part of our responsibility includes educating our patients about the consequences of their dependence.

Mara G. Coyle MD'86, P'15

Associate Professor of Pediatrics (Clinical), Alpert Medical School Staff Neonatologist, Women & Infants Hospital Director, Newborn Medicine, St. Luke's Hospital New Bedford, MA



We Meet Again

Photographer Karen Philippi (right) found herself in a familiar place for this issue's assignment: her doctor's office. Neha Raukar, MD, helped Karen recover from a series of concussions last year that left her with mental fogginess and dizziness. With Raukar's help, Karen was able to return to her passion and profession, as proprietor of Philippi Photographi.

VICTORIA PHILIPPI



COMING ATTRACTIONS

October 19, 2013

White Coat Ceremony
brown.edu/go/mdfamilyweekend

February 1, 2014

Alumni/Student Networking Reception
brown.edu/go/mdalum-events

March 7-8, 2014

Brown's 250th Anniversary Opening Celebration
brown.edu/about/brown250

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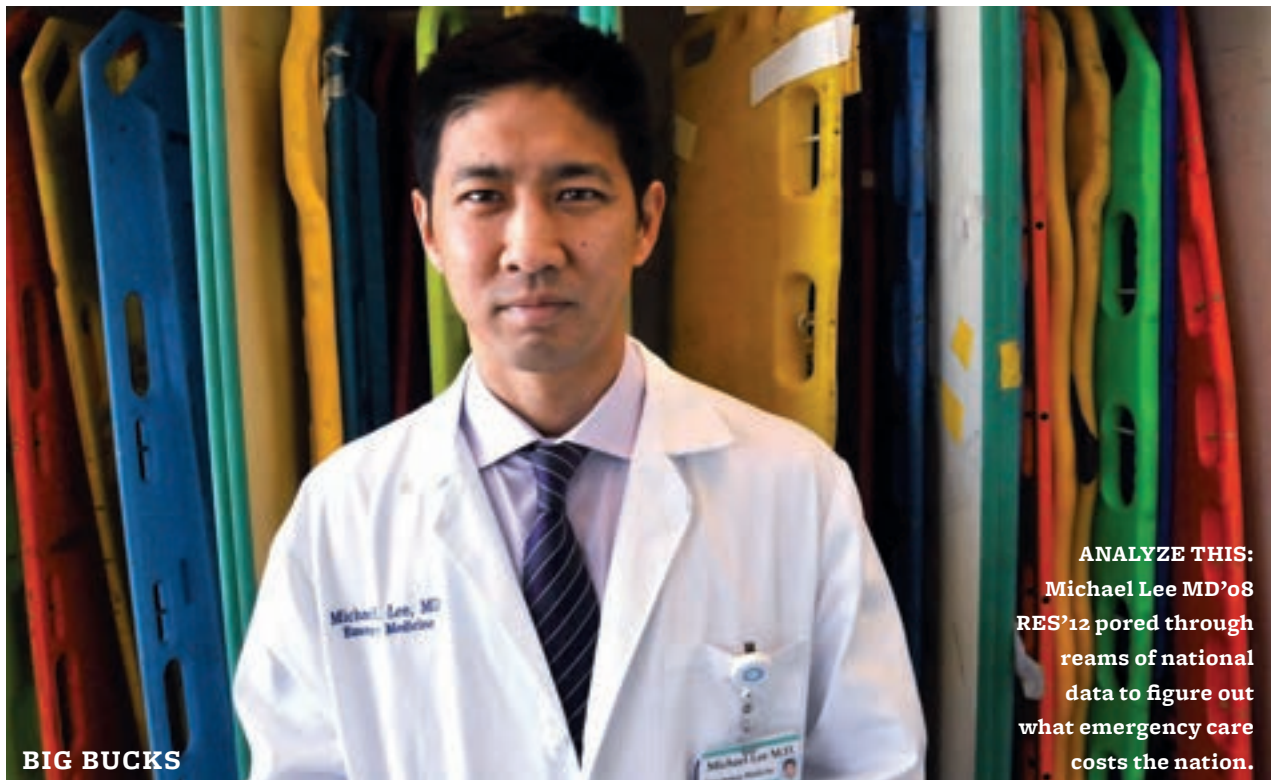
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WHAT'S NEW IN THE CLASSROOMS, ON THE WARDS, AND IN THE LABS



BIG BUCKS

ANALYZE THIS:
Michael Lee MD'08
RES'12 pored through
 reams of national
 data to figure out
 what emergency care
 costs the nation.

Necessary Spending

Researchers put a price on emergency care.

Emergency care is expensive. But it might be even pricier than anyone thought—eating up to 10 percent of the nation's total health care spending.

“The ER has become increasingly important as a place where people go for acute unscheduled care,” says Michael Lee MD'08 RES'12, lead author of a paper published online in the *Annals of Emergency Medicine* in April. “However, there has been little rigorous analysis of its cost structure.”

Lee, an assistant professor of emer-

gency medicine at Alpert Medical School, wrote the analysis with Brian Zink, MD, Frances Weeden Gibson-Edward A. Iannuccilli, MD, Professor and chair of the Department of Emergency Medicine at Alpert Medical School; and Jeremiah Schuur, MD, assistant professor at Harvard Medical School.

Though they acknowledge that their analysis may invite criticism of emergency care as unnecessary or inefficient, the authors conclude that “the high share of spending affirms the impor-

tance of emergency medicine within the health care system. With 130 million visits, 28 percent of all acute care visits, and accounting for nearly half of all admissions, emergency medicine should be expected to represent a large share of health care spending.”

The first number the authors examine is \$48.3 billion. That's how much the Agency for Healthcare Research and Quality's Medical Expenditure Panel Survey estimates the US spent on emergency care in 2010—less than 2 percent of total health care expenditures.

But other study data indicate that the survey undercounts emergency department visits and the number of ED patients

admitted to hospitals. Adjusting for those discrepancies, the authors estimate that ED costs are between 4.9 percent and 5.8 percent of total health care spending. Going on to review data from a major national private insurer, their estimate of ED expenditures climbs to between 6.2 and 10 percent.

Lee, who worked in economics and finance before training in emergency medicine, says the ED cost structure remains poorly understood and is significantly more complex than what is modeled in existing studies. Even after

adjusting for inflation, costs vary widely: Across four major studies over the last three decades, the average cost per patient of an ED visit, in 2010 dollars, ranged from \$134 to more than \$1,000, the authors found.

New methods are needed to measure ED expenses, the authors write, but they add that the value of emergency care, not just the cost, should be part of any discussion of reform. For example, efforts by private and government payers to divert care may not lead to large aggregate savings, Lee says.

Though the authors write that we should recognize the importance of the ED within the health care system and demonstrate that costs are commensurate with value, Lee acknowledges that this remains a challenge.

“The core of our business is ruling out critical diagnoses,” he says. “Many of the things we look for are low probability but highly dangerous conditions. The big question is, how do you quantify value when your work is often focused on trying to demonstrate the absence of something?” —**David Orenstein**

Ask THE EXPERT

Sleep on It

Why does getting some shut-eye help us learn new things?

Researchers have long considered deep sleep critical to the strengthening of new memories, including learning motor-sequence tasks like playing the piano or typing. But what part of our brain is making that happen? What’s going on in there while we snooze?

Masako Tamaki, PhD, a postdoc in Brown’s Department of Cognitive, Linguistic, and Psychological Sciences and lead author of a study published in August in the *Journal of Neuroscience*, has the answer.

Sleep benefits various types of learning and memory, including motor-sequence learning. But how the brain consolidates what we have learned during sleep was unclear. To identify the core brain region associated with sleep-enhanced learning of sequential finger-tapping tasks, we first scanned volunteers’ brains while they slept with magnetoencephalography (MEG), which precisely measures oscillations, and polysomnography (PSG), which tracks sleep phase, to obtain baseline measurements of their brain activities. They then learned a finger-tapping task and went to sleep, and we again scanned them with MEG and PSG, as well as MRI, which maps brain anatomy, to locate the MEG oscillations in each

volunteer’s brain. Control subjects did not sleep after learning the task.

We found that performance of the finger-tapping task significantly increased after sleep compared to performance before sleep. The improved speed and accuracy volunteers showed on the task after sleep were significantly associated with changes in fast-sigma and delta brainwave oscillations in their supplementary motor area (SMA), a region on the top-middle of the brain. The delta oscillations appeared to govern the changes in the SMA’s connectivity with other areas of the cortex, while the fast-sigma oscillations seemed to pertain

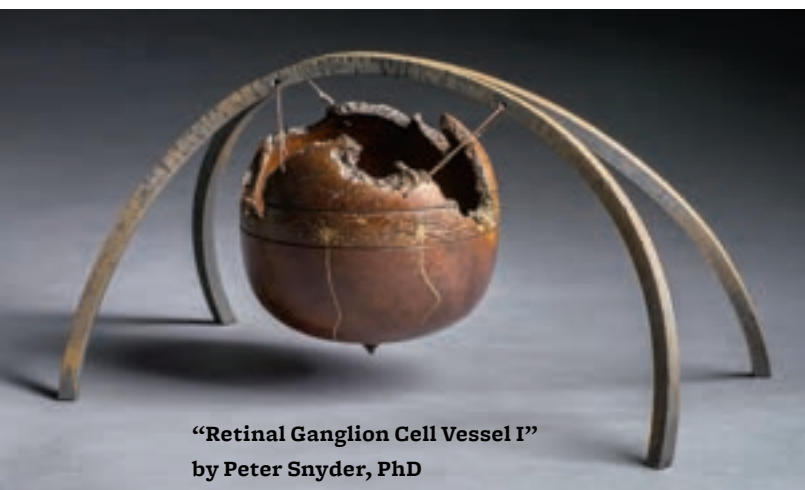
to changes within the SMA itself. These brainwave changes occurred during a phase known as slow-wave sleep, or deep sleep. The sleep-dependent consolidation may involve reorganization within the SMA and cortical regions in other areas of the cortex. For our next project, we will look at visual learning tasks to further understand how the brain consolidates learning.

*Tamaki’s coauthors include Associate Professor **Yuka Sasaki**, PhD, and Professor **Takeo Watanabe**, PhD, both of the Department of Cognitive, Linguistic, and Psychological Sciences, which is affiliated with the Brown Institute for Brain Science.*

EXTRACURRICULAR

At a Crossroads

Scientists exhibit their artsy sides.



“Retinal Ganglion Cell Vessel I”
by Peter Snyder, PhD

Many people pursue hobbies to get their minds off work—especially, you’d think, people whose work is the mind. But neuropsychologist Peter Snyder, PhD, finds a natural intersection between his career and his art. Though the titles of his wood-and-metal sculptures suggest plates in a textbook—“Hippocampal Pyramidal Cell Vessel I,” “Retinal Ganglion Cell Vessel I”—the elegant carvings, and their intricate designs, have a rightful place in any art gallery.

This summer, three of Snyder’s works were on display in an exhibit organized by the Rhode Island School of Design and

Rhode Island Hospital to celebrate the hospital’s 150th anniversary. “Carrefour: Intersections of Biomedical Research and Art,” at RISD’s Sol Koffler Gallery in Providence, featured 11 Rhode Island artists, some of whom also work in biology or medicine. Snyder, a professor of neurology (research) at Alpert Medical School and vice president for research for Lifespan Hospital System, notes the trillions of neural connections that enable human consciousness as well as all bodily functions. “As I make my work, I focus my hand and attention, but I also daydream about how incredible it is that my brain is able to reflect intently on its own cellular and molecular organization,” he writes in his artist statement.

“Carrefour” also featured performance videos by Torino: Margolis, the collaborative team of Jenny Torino, MS, RD, LDN, and Benjamin Margolis, MD RES’16, a neurology and psychiatry resident. The couple’s art employs electronics and biomedical tools, such as electromyography, which captures a performer’s actions and transforms the data into sound. Through those sounds, they write, “the physiological difference between intentional and unintentional movement is illustrated in order to exemplify the performer’s ‘free will.’”

Dominating an entire gallery wall, visible from the street, was a nearly 5-foot-long digital print by electron microscopist Geoff Williams, MS, the manager of Brown’s Leduc Bioimaging Facility. He produced his black-and-white image, “Malaria Infected White Blood Cells,” with a scanning electron microscope. “The ability to present biological information in a visual way draws viewers in, engaging them in a way that isn’t possible with words alone,” Williams writes. —Phoebe Hall

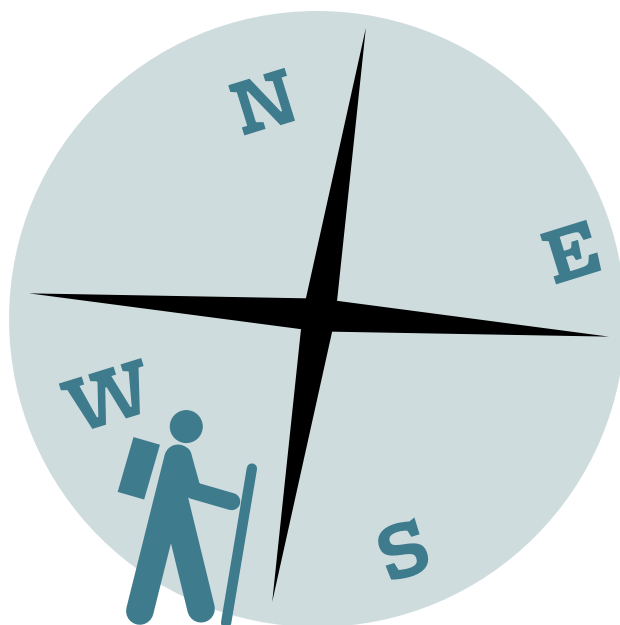
FINDINGS

Don’t Leave Home Without It

According to a study by Ryan Mason MD’14 that was published in the journal *Wilderness & Environmental Medicine* in May, only 18 percent of hikers surveyed in New Hampshire’s White Mountain National Forest brought all 10 items that the state’s HikeSafe program says are essential for any hike:

- | | | |
|---|--|------------------------------------|
| <input type="checkbox"/> Compass | <input type="checkbox"/> Fire starter | <input type="checkbox"/> Knife |
| <input type="checkbox"/> Extra clothes | <input type="checkbox"/> First aid kit | <input type="checkbox"/> Map |
| <input type="checkbox"/> Extra food and water | <input type="checkbox"/> Flashlight | <input type="checkbox"/> Rain gear |
| | | <input type="checkbox"/> Whistle |

Mason says knowing the gaps in hiker preparedness will help education efforts and could reduce injuries and costly search-and-rescue missions. —P.H.



COURTESY PETER SNYDER; MINDY OSWALD

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HOSPITAL

A Few Good Women

Dawna Blake, MD, clinical assistant professor of medicine and director of Women's Health at the Providence VA Medical Center, offers remarks at the May ribbon-cutting on a 2,200-square-foot Women's Health Center, above. The center, in a free-standing building adjacent to the hospital designed with all the features "women veterans request most," offers a room for gynecological exams and procedures, a family restroom with a baby-changing table, and a children's play nook stocked with crayons and coloring books. According to the VA, the number of women veterans seeking health care has more than doubled since 2000. At the Providence VA, 2,500 women have enrolled, with more than 1,300 receiving care. —Kris Cambra



RESEARCH

Hard Core

A statewide directory of core research facilities comes to life.

In July 2012, a committee of physician-scientists and administrators from Brown, Lifespan, and Care New England convened to explore opportunities for greater collaboration and synthesis among researchers at their respective institutions.

Many meetings and many hours later, the committee's efforts were realized, in part, with the September launch of CoresRI.org, a searchable online database of core research instruments and services at institutions across Rhode Island. The site features a range of tools—from electron microscopes to biospecimen banks—housed in research facilities at Brown, Rhode Island Hospital, Women & Infants Hospital, University of Rhode Island, Providence VA Medical Center, Rhode Island School of

Design, Bryant University, and Providence College.

Researchers can search for equipment and services by name, location, or field of academic inquiry. Search results yield specifications for each instrument

CoresRI

and service as well as relevant contact information and a link to a facility website.

While similar online research directories exist, CoresRI is the first to focus exclusively on services and technologies in the Ocean State. The site is an inventory of sorts, at once linking investiga-

tors to relevant resources while showcasing the breadth and depth of Rhode Island's research landscape.

And in a post-sequester funding climate marked by thinning budgets and ever-shrinking resources, committee members are quick to note the site's potential to further inter-institutional collaboration and generate savings. "In these days of tight federal and foundation budgets, collaboration across core laboratories in equipment use and sustainability will help us to use our precious resources most efficiently," says James Padbury, MD, William and Mary Oh-William and Elsa Zopfi Professor of Pediatrics for Perinatal Research.

Suzanne de la Monte, MD, MPH, professor of neurosurgery and pathology and laboratory medicine, says the site meets a critical need that predates the nation's economic woes. "Even before the souring of the economy, the need for an effective website with a user-friendly catalog of facilities, equipment, and services was evident," she says.

—**Jumoke Akinrolabu Dumont**

ELEVATOR PITCH



Allan R. Tunkel,
MD, PhD

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Back to School

The new associate dean for medical education focuses on student needs.

Last summer, Allan R. Tunkel, MD, PhD, began his role as associate dean for medical education, succeeding Associate Dean Philip Gruppuso, MD. Tunkel brings to Brown an exceptional background in medical education, administration, and clinical care. Most recently, he served as chair of medicine at Monmouth Medical Center and professor of medicine at Drexel University College of Medicine in Philadelphia.

An undergraduate of Seton Hall University, Tunkel later pursued a PhD in experimental pathology followed by a medical degree at the University of Medicine and Dentistry of New Jersey, New Jersey Medical School. He has received numerous teaching awards and honors and is passionate about physician training. He is also widely acknowledged as an expert in bacterial meningitis.

As associate dean, Tunkel will have primary responsibility for the undergraduate medical education programs at Alpert Medical School. He will supervise

curriculum planning, evaluation, and management for the four-year medical program and Brown's Program in Liberal Medical Education; oversee medical school admissions, financial aid, regis-

trar activities, and the Office of Diversity and Multicultural Affairs on student recruitment; and assume primary responsibility for medical school accreditation requirements and processes.

Tunkel talked to *Brown Medicine* about his new role.

What attracted you to Alpert Medical School and to this position?

Most significantly, it was the people whom I met. While the new Medical School building is quite beautiful and

offers state-of-the-art facilities, I was most impressed with the faculty and staff and their dedication and commitment to providing an outstanding educational environment for the medical students. Alpert Medical School is also nationally recognized for innovations in medical education (especially the development of a competency-based curriculum), and the opportunity to be part of these innovations was very exciting.

What do you believe are the biggest challenges in medical education today—at Brown and broadly?

One of the most important challenges in medical education is to prepare students for an ever-changing health care environment. With shifting national demographics and new models of health care and payment, graduating medical students must possess the knowledge and skills to provide patient-centered care with multidisciplinary teams in both the inpatient and outpatient environments. It is critical that students also understand health care transitions for vulnerable patient populations; individual patient outcomes as well as outcomes in populations of patients related to specific interventions

“Career guidance must be a top priority and an evolving, personalized, and relevant process.”

in care management; accountable care; patient safety; public health, health policy, and economics; information technology; and diversity, cultural competency, and health care disparities.

What are some of the initiatives you hope to build on or create?

One of the most important components of medical education today is career counseling and development to ensure that graduating medical students are well positioned to begin residency

training and to find and thrive in a meaningful career. Many new medical schools have been established throughout the country, and many established schools have increased their enrollments without a concomitant increase in residency positions. In this competitive environment, pursuing an optimal career will become even more difficult. Career guidance must be a top priority and an evolving, personalized, and relevant process throughout the medical school experience. Alpert Medical School's establishment of the academies, development of an Individual Education Plan for students based on their career goals, and recruitment of Careers in Medicine faculty were critical steps in achieving these important goals, but these programs must continue to evolve in response to external forces that may present significant challenges.

What experiences have prepared you for these goals and challenges?

Throughout my career, I have never lost sight of what I feel is the primary mission of the medical school: to teach and train medical students and residents, and to help develop the careers of faculty and staff. It is what attracted me to medical education in the first place and it continues to be the driving force in my career. The professional and personal experiences that have prepared me for these goals and challenges are myriad—residency program director, chief of infectious diseases, vice chair for education in the department of medicine, associate dean for admissions, senior associate dean for academic campuses, chair of medicine, and, most importantly, husband and father.

What is your favorite—and least favorite—thing about Rhode Island so far?

Most favorite: the people I have met.
Least favorite: the people I left behind.

—*Kylah Goodfellow Klinge*

WHO KNEW?

Crowning Achievement

A beauty queen shines the spotlight on heart disease.

Amber Clark MD'16 doesn't believe in luck. But after winning beauty pageants, scholarships, and research grants and gaining admission to Alpert Medical School, she does admit she's "truly blessed."

"I'm not a typical pageant girl," Miss Black Rhode Island USA 2013 insists. "I didn't know how I'd do [a pageant] while I was in med school. But I'm always looking for scholarships, so I said, you know

her mother, a pharmacist, inspired her career path. "I really liked the way she interacted with customers, but I wanted a more hands-on approach," she says. She was attracted to Tougaloo by its Jackson Heart Study Education and Training Program, which explores why cardiovascular disease is more prevalent among African Americans.

"I don't want to just treat my patients when a problem has already occurred,"

"I want to get to the bottom of **why health disparities plague minority communities.**"

what, why not." After all, she'd won the Miss United Negro College Fund pageant in 2008 while juggling her undergraduate studies at Tougaloo College.

Miss Black USA's mission also dovetails nicely with one of Clark's passions—heart disease. The organization partners with the NIH's National Heart, Lung, and Blood Institute (NHLBI) to raise awareness about heart disease among women of color. Hand in hand with that campaign, she adds, "I am using my platform to speak out about health disparities."

Clark, a native of Monroe, LA, says

Clark says. "I want to prevent problems from happening, help patients get control of the issues they have—and I want to get to the bottom of why health disparities plague minority communities."

In the summer after her first year in Providence, Clark received a NHLBI Diversity Supplement Award to assess the Jackson Heart Study's Know Your Numbers Program. Her research showed that the program—which teaches high school students to track their blood sugar, cholesterol, and other key health indicators—was increasing awareness, and she's now working to implement the program more widely.

"All things work together," Clark says of the confluence of her career ambitions and pageant success. Yet as she began her third-year clerkships this spring, she recognized a need to prioritize, with school always coming first.

"Med students tend to have type-A personalities, adding everything to our plates," she says. "It's only by God's grace that I'm doing any of this. There are more than 24 hours in a day—like, 27." —*P.H.*



STAT SHEET

Get to Know Them

A new class takes shape at Alpert Medical School.

The 120 students in the MD Class of 2017 were selected from the largest applicant pool in Brown history. The future physicians hail from 28 states, the District of Columbia, and South Korea. Experiential diversity is a hallmark of the group: nearly half of the students waited at least a year before matriculating, with 41 taking off more than two years between college and medical school. An even dozen hold advanced degrees, in education, English, mechanical engineering, law, neuroscience, public health, and physiology.

One-third of the students have studied or volunteered internationally, in countries such as India, Kenya, Malawi, Mauritius, Peru, Uganda, and Vietnam. The class includes two Peace Corps veterans; a Clinton Fellow; five Teach for America alumni; a lawyer; a circus performer; Fulbright and Truman scholars; consultants and finance professionals; a professional dancer; a chemistry teacher; a professional figure skater; firefighters and EMTs; musicians and singers; and a lineup of athletes, from swimmers and runners to soccer and rugby players.

TOTAL STUDENTS	120
Female	63
Male	57
AMCAS (Standard route of admission)	63
Program in Liberal Medical Education	45
Postbaccalaureate	10
Early Identification Program	2
 AGE RANGE	 21-35
 ADVANCED DEGREES (MPH, MS, MPhil, JD)	 12
 UNDERGRADUATE INSTITUTIONS	 51
Public	11
Private	40
 UNDERGRADUATE MAJORS	
Humanities	33%
Physical and Life Sciences	56%
Mathematics, Computer Science, Biomedical Engineering	6%
Independent concentrations	5%

ANATOMY OF A THIRD-YEAR STUDENT

Having a Ball

When you have a lot of doctors in the family—including both parents and two of three sisters—you have a lot of people to turn to for advice in med school. But Danielle Comissiong '11 MD'15, an avid volleyball player, credits an Alpert Medical School tip for keeping her in the game. “They say early on in med school that life only gets busier the further you go in your career,” says Comissiong, 24. So make your favorite hobby a priority, because “if you stop now, you’ll never be able to pick it up again.” The US Virgin Islands native started playing volleyball on the beaches of St. Thomas when she was 8 years old; now, as a member of two local leagues, she happily juggles games with her busy student schedule. “It’s something I look forward to all week,” she says. As Comissiong rotates through her third-year clerkships, a new ball is in her court: choosing a specialty for the residency match process next year. “I originally wanted to do surgery,” she says. Now she’s considering family medicine with an emphasis in women’s health or ob/gyn.

—P.H.

THE RIGHT TOOLS

One of Comissiong’s older sisters, a recent med school grad herself, told her what she’d really need for class. **In:** reflex hammer and tuning fork, which she’ll use the rest of her career. **Out:** sphygmomanometer, available in every exam room.



ADAM MASTOON

ALL-AROUND ATHLETE

A softball player since age 7, Comissiong was an outfielder for the Bears and team captain as a junior. The busy PLME didn't play her senior year; with the varsity schedule, "I never had time for anything else."



OLD SOLES

Comissiong and her mom bought matching sneakers together five years ago. This is the pair she actually wears to play volleyball; the black ones in her photo are just for show.



GO VIKINGS

Lori McDonald, below left, and Sasha Levons, right, were Comissiong's best friends in high school. "I always imagined myself at a big sports school where I could paint my face," she says. But she loves Brown anyway.



KEY ACCESSORY

Besides the keys themselves, the most useful thing on Comissiong's keychain is the Swiss Army knife—especially since she discovered the straight edge of the nail file can double as a screwdriver.



JOIN THE CLUB

Volleyball was always Comissiong's favorite sport, but at 5 feet, 5 inches, the outside hitter says she was too short for the varsity team. She played intramural volleyball all four years at Brown.



DROPPED CALL

Comissiong has dropped her cell phone "a million times," including from a roller coaster at Six Flags New England, but the screen finally shattered in a parking lot as she was getting out of her car. The four-year-old device is still going strong.



WHAT NOT TO WEAR

Comissiong wouldn't wear her favorite bracelet on her family medicine rotation, "because when we do procedures I would hate for the charms to get in the field."

FINDINGS

Cry Baby Cry

A new tool helps researchers analyze infant sobs.

To parents, a baby's cry signals hunger, pain, or discomfort. But to scientists, subtle, almost imperceptible variations in a cry can hold important information about a baby's health. A computer-based tool, developed by researchers at Alpert Medical School and Brown's School



of Engineering, analyzes the acoustic signals of cries, which could help caregivers pinpoint problems.

"Cry can be a window into the brain," says Barry Lester, PhD, professor of psychiatry and human behavior and professor of pediatrics. "Early detection of developmental disorders is critical. It can lead to insights into the causes of these disorders and interventions to prevent or reduce the severity of impairment."

The analyzer evaluates cries for 80 different parameters, each of which could hold clues about a baby's health. Stephen Sheinkopf, PhD, assistant professor of psychiatry and human behavior, plans to use the tool to find cry features that might correlate with autism.

"Older individuals with autism produce sounds or vocalizations that are unusual or atypical," he says. "Cry analysis can be a noninvasive way to get a measurement of disruptions in the neurobiological and neurobehavioral systems in very young babies." —**Kevin Stacey**

START-UP FUND

Primary Care, Revisited

AMA bestows grant on innovative education program.

Plans for a new dual-degree Primary Care-Population Medicine Program got a big boost in June with a \$1 million grant from the American Medical Association (AMA).

The program, first announced in January, will admit 24 students a year beginning in fall 2015. With a focus on population science and behavioral and social medicine—as well as teamwork and leadership—the program's ultimate goal is physicians who are leaders in community-based primary care.

For example, third-year students in the new program will engage in long-term primary care clerkships with patient populations, rather than rotating every six weeks through clerkships of various specialties at different hospitals. In their fourth year, students will take courses in population medicine and complete a master's thesis.

Alpert Medical School was one of 11 schools to earn a grant out of 119 that applied to the AMA's Accelerating Change in Medical Education initiative. The funding, allocated over five years, will be used for planning, piloting, creating an admissions process, and evaluation.

AMA President Jeremy A. Lazarus, MD, says grant recipients were selected "for their bold, transformative proposals designed to close the gaps between how medical students are trained and how health care is delivered."

The AMA will establish a learning consortium among the selected schools to share best practices with other medical and health profession schools. —**P.H.**

OVERHEARD

"I'm not saying if you didn't breast feed, you're doomed. We couldn't control for things like how much interaction a kid has with his parents, what kind of learning environment he lives in, and so on. There are a lot of factors that go into making a successful adult."

—**SEAN C. L. DEONI, PHD**, assistant professor of engineering and head of Brown's Advanced Baby Imaging Lab, in the *New York Times Well* blog on June 13, 2013. Deoni was lead author of a study, published in *NeuroImage*, that found enhanced brain development in breastfed infants.

RESIDENT EXPERT

BY ALEXIS DRUTCHAS, MD RES'

Carry That Weight

An intern comes to terms with her new role.

We have all prepared incessantly for internship; years spent studying nuances of pharmacology and pathology, setting out to see our own patients and answering meticulous questions on rounds. By the time we graduate we feel exposed, or at least this is how I felt beginning my intern year. Looking back now, many of my assumptions about intern year were correct. Yet there is one aspect of this new identity that I could never have prepared for: the feeling of truly being someone's doctor.

I'll call her Missy. I met her during my first inpatient rotation and was struck by her heartwarming smile and Southern accent. Missy was febrile, neutropenic, and hypotensive. She had never smoked a cigarette, but after multiple rounds of chemotherapy and radiation she was dying of lung cancer. One day when there was an afternoon lull I went to check on her. She looked worn, struggling even to say hello. Sitting on the edge of her bed I asked her how she was doing. "I've been better," she answered.


Since she had become sick, her loving partner had shut down; he could not face losing her. Missy was exhausted from fighting, worried about dying, and very alone. I asked her who her support could be. She told me about her best friend in Canada, a woman whom she spoke to frequently but had hid her diagnosis from. Missy did not want to put this burden on someone else. Yet, she expressed that this friend might be the only one who would deeply understand and help her cope. In the quiet of the afternoon, she reached out, pulled on the corner of my white coat, and started to cry.

We all in our own way bear the weight of the living; we carry the responsibility of patients, of friends, of loved ones. In medical school we become accustomed to feeling that our knowledge base is what we can offer. Possibly as physicians, this is what we use to protect ourselves from the heaviness. But as I sat there with Missy in the quiet, nothing that I learned in medical school could help her, or could protect me.

Over the course of the week Missy's health improved. Preparing for her discharge, I went through the usual routine: medications, follow up, questions. Then, I reached into my pocket and pulled out a prescription. "What is this?" she asked.



"Your only prescription to fill when you leave," it read, "is to call your best friend. She loves you and I am sure she would want to be there for you if only she knew." Missy and her husband both started to cry. Then with great effort she pulled oxygen into her weakened lungs, stood up, and wrapped her arms tightly around me.

A year later, I look back on that moment and it still strikes me. For all of the time spent memorizing, rounding, and writing notes, I do not feel that I truly understood what it meant to be a doctor until that afternoon. For me, it is about honoring the humanity in another. It is being a source of trust in my patients' lives in their dark times and not sheltering myself from this. It is learning how to tenderly hold this weight. 

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.

ZOOM

BY EILEEN O'GARA-KURTIS

Life in Motion

A GPS-like imaging system tracks the movement of genetic material.

Thinking big in Brown's Department of Molecular Biology, Cell Biology, and Biochemistry often means going very, very small. Faculty, students, and staff in the Division of Biology and Medicine's largest on-campus department are studying life's tiniest elements to understand some of our biggest mysteries, from infertility and aging to autism and cancer.

At the helm is Kimberly Mowry, PhD, Robin Chemers Neustein Professor of Biomedicine, who has chaired the department—a dynamic vessel for active, organic cross-pollination of ideas, where researchers collaborate from laboratory to laboratory and gather weekly for multidisciplinary seminars sponsored by Brown's interdepartmental graduate program—since 2009.

The department is on the cusp of a new chapter, having recently completed an external review by a team of leading scientists from across the United States. It's a rigorous evaluation and strategic planning process that happens about once a decade. "MCB is such a rich intellectual gathering place," Mowry says. "Our faculty and students are incredibly diverse, and everyone has a profound interest in what's going on scientifically throughout the department."

An accomplished researcher in her own right, Mowry, who earned her doctorate at Yale, studies how the location

PATRICK O'CONNOR





THOUGHT LEADER
Kim Mowry's impact
as a teacher was
recognized in 2007,
when she was awarded
Brown's Elizabeth
Leduc Award for
Excellence in
Teaching in the
Life Sciences.

ZOOM

of genetic material in an egg cell ultimately influences gene expression and development. But it was Brown's commitment to undergraduate education that helped attract her to Providence in 1992, after she completed her postdoctoral fellowship at Harvard. "People who aren't interested in teaching don't come to Brown," she says.

Mowry teaches a foundations course for students who are beginning graduate work and another graduate-level course designed to teach the art of scientific communication, from written and oral communication to grant writing. A biochemistry major as an undergraduate at the University of California, Berkeley, she now teaches the subject at the introductory level to more than 200 students, many of whom are pre-medical or are enrolled in the Program in Liberal Medical Education.

"I get a kick out of teaching biochemistry," she says. "I love showing students how exciting and cool science is ... and teaching at Brown is especially reward-

Mowry vividly remembers how she got her start in research, as a second-year undergraduate studying signaling mechanisms in bacteria in the laboratory of Daniel Koshland Jr., PhD, who later became the editor of *Science*.

"I remember thinking 'Wow! This is so cool. ... We are figuring out things that people don't know yet,'" she says. "It was intoxicating. It still is."

REAL-TIME TRACKING

The team of undergraduates, graduate students, postdoctoral fellows, and faculty working in Mowry's Sidney Frank Hall laboratory share her enthusiasm. They are studying the inner workings of the oocyte of *Xenopus laevis*, the African clawed frog—specifically, the intracellular travels of messenger RNA, the microscopic couriers of life's most basic components.

"The role of RNA in gene expression and genetic transfer is intrinsic to the central dogma of molecular biology," she says. "But we actually know com-

"We know that similar mechanisms have been observed in both frog oocytes and *Drosophila* [fruit fly] oocytes, and in fact the activities of molecular motors and proteins are common to fungus, yeast, flies, frogs, all the way to mammalian cells," says Gagnon, now a Harvard postdoctoral fellow. "Are these processes random? Logically, it makes sense that the cells are doing this on purpose. And it's very unlikely that these mechanisms evolved independently; more likely, they originated with a common ancestor."

The cellular information superhighway begins in the nucleus, from which mRNA molecules carry data encoded in DNA to the ribosome. There they specify the amino acid sequence for the synthesis of proteins, the end products of gene expression essential to bodily structure and function. Until recently, the infinitesimal road maps that mRNA followed on this vital journey could be captured only in a series of still images, not in real-time movement, severely limiting the degree to which researchers could identify and analyze the process. Preparing a *Xenopus* oocyte for observation also destroyed the cell—leaving a frozen snapshot of life as it was, rather than life in motion.

Mowry's lab is ushering in a new era in scientific surveillance, using a method of tracking mRNA movement in live frog oocytes developed during a multi-year research project led by Gagnon and published earlier this year in *PLOS Biology*.

"As is often the case in research, it took us 90 percent of the time to complete the final 10 percent of the work," Gagnon says. "Getting from 'it sort of worked' to 'it worked' took seven years."

In order to discern the precise path

ing. We have such excellent graduate students and informed undergraduates.

"I know that every student won't pursue a career in science, and that's fine. It's our responsibility to contribute to the scientific literacy of our society by building a broad knowledge base in all professions."

paratively little about exactly how RNA is transported within the cell."

Knowing more about those pathways would open up many new avenues for research. It would also be a window into identifying common processes that transcend species, according to James Gagnon PhD'11, who studied in Mowry's lab.

"I get a kick out of teaching biochemistry. I love showing students how exciting and cool science is."

Live imaging allowed the researchers to **explore how mRNA is transported**, how quickly it travels, and in what direction.



FROGGY WENT A-COURTIN'
The African clawed frog is an ideal model because its oocytes and eggs are large and easy to manipulate.

of mRNA within the *Xenopus* oocyte, the researchers attached tags, illuminated by fluorescent proteins, to mRNA molecules and watched where they went. “What became visible was a very complicated system of highways within the cell, running in different directions, on which the mRNA were transported by molecular motors,” Gagnon says.

But with only the still-picture meth-

od at their disposal, the researchers—Gagnon, Mowry, lab manager Erin Powrie, PhD, and postdoctoral associate Timothy Wood, PhD—still could not determine exactly what was going on. That was when Jill Kreiling, PhD, assistant professor of biology (research), a microscopist, joined the team. Using confocal microscopy, which offers high-resolution observation of live cells,

Kreiling helped them develop a way to capture the process in motion, making it possible to visualize the migration of mRNA in a live frog oocyte, in real time, for the first time.

Live imaging allowed the researchers to explore how mRNA is transported, how quickly it travels, and in what direction. “We discovered—and this was a bit controversial—that molecular motors that pull in different directions actually move mRNA in one direction,” Gagnon says.

“We’ve developed a tool that can answer a host of questions,” he adds. “It holds enormous untapped potential for studying gene regulation, and offers a more efficient way of localizing the activity of genes.”

Mowry is careful not to overstate the clinical implications of the innovative basic research underway in her lab. These are very early days. But she suggests that understanding how mRNA molecules arrive at their intended destinations could someday lead to new insights about neurodevelopment, embryonic development, and cell motility, with possible relevance for reproductive medicine, cancer treatment, and understanding and addressing syndromes linked to neurological defects, such as Fragile X.

Her lab’s work, she says, “has yielded new knowledge, and also given us a foundation for future inquiry, with the ability to ask questions that were previously unapproachable.”

Eileen O’Gara-Kurtis is the founder and president of Silver Branch Communications. She is a frequent contributor to Brown Medicine.

FIELDNOTES

BY CAMIA DIMOCK '08 MD'13



Could a Stethoscope Save a Coral Reef?

If the people are healthy, the environment is healthy.

We were huddled close together, one in front of the other, legs tucked in, hands grasping at the wooden edges of the *longbot*—a Papuan canoe dug out from an old *merbau* tree with a 20-horsepower motor on the stern. Heading to the next village, my husband and our two research assistants made our way along the rugged limestone coast of Waigeo Island.

When we arrived, the village leader's words echoed what we heard in so many other villages: "*kalau kitorang sehat, alam juga sehat*"—a simple idea meaning, "if we the people are healthy, the environment is also healthy." After months of traveling from village to village, we

began to understand the deep connection Papuan communities have with nature. They see themselves as stewards and guardians of the forests and the seas, praying to spirits as we crossed sacred rivers and mountains. These spirits in turn have looked after the villagers for generations, providing them with vegetables to cook, fish to harvest, and strong hardwoods to build their homes. They live in harmony with nature.

Perhaps it was growing up between coastal Rhode Island and Indonesia, my dad's stories as a Peace Corps volunteer, or my fascination with the great oceanographer Jacques Cousteau, but at a

young age I developed a love for the sea and viewed Indonesia as a second home. At age 10, I survived dengue hemorrhagic fever and became passionate about pursuing a career as a physician. I enrolled in Brown's Program in Liberal Medical Education and majored in cultural anthropology. However, after years of classwork, I was longing for experience in the field. So in 2009, I deferred medical school to become a Fulbright Scholar in West Papua, Indonesia. In 10 months, my husband and I traveled to six islands and 30 villages and surveyed 325 households about their health, livelihood, and perceptions of environmental conservation.

RAJA AMPAT

Our research efforts were focused in the Raja Ampat archipelago off the northwest tip of West Papua. Described as the heart of the Coral Triangle, it is home to the richest marine biodiversity in the world, with more than 1,800 fish species and 600 coral species. Also renowned for its wealth in forest ecology and natural minerals, Papua province is the most impoverished province in the country, with some of the highest rates of HIV, malaria, and infant and child mortality. Many refer to this as the Papua Paradox.

Our own research confirmed these findings. Most families reported an incidence of malaria or malaria-like symptoms two to three times within a six-month period. Other common health conditions included tuberculosis, diarrhea, malnutrition, cataracts, tooth decay, upper respiratory infections, and leprosy. Rates of child mortality were reported far higher than any other province in Indonesia, at approximately 20 percent.

In 2009, we documented emergency

The communities themselves **described**
the connections between their own health
and that of reefs and forests.

health care costs ranging from \$240 to \$650, similar to the average annual household income. These high costs are largely due to the necessity of traveling long distances to obtain care and also expensive rates for services. Fewer than 35 percent of individuals save money for future needs such as a child's education or emergency health crises. When asked how individuals found the money to cover health costs, 40 percent said they would do one or more of the following: fish more, fish for high-priced and over-exploited species such as lobster and sea cucumber, or cut rare species of tropical hardwood. To raise the \$200 needed for transportation and payment of health services in an emergency, an individual would have to collect more than 100 kilograms of sea cucumber. The conclusion: poor health care access combined with high health care costs were leading directly to overexploitation of the natural environment.

HEALTH IN HARMONY

I first met Kinari Webb, MD, at a small coffee shop outside of Jakarta. She originally came to Indonesia to study orangutans in Gunung Palung National Park, West Kalimantan, where she also met her husband, Cam, a forest ecologist. Just as we had observed in Raja Ampat, Kinari and Cam identified that poor health and severe poverty had pushed

populations to engage in illegal logging and other destructive use practices. Only two years into her work at that time, she was redefining the models of health care delivery and conservation, recognizing that preservation of the orangutan's habitat was dependent upon better health care and livelihoods for the villagers who surround the park's borders.

Her organizations Health in Harmony and Project ASRI combine health care, conservation, environmental education, and alternative livelihoods in a holistic approach to improve both human and environmental health. Their unique program offers high-quality health care that can be paid for with non-cash options that enhance the environment. For example, a farmer could exchange tree seedlings that would be used in reforestation efforts for basic health care.


In just five years, their program has shown a 68-percent reduction in illegal logging households around Gunung Palung National Park and an 18-percent decline in infant mortality. And so the question became, could we take this model, adapt it to the unique health needs and marine conservation efforts in Raja Ampat, and also see it succeed?

PULANG PAPUA— RETURNING TO PAPUA

Last May, we returned to West Papua with several Health in Harmony staff to

answer this question. Traveling to many of the same villages, we held focus group sessions into the night, listening to community members explain how changes in the surrounding environment had an impact on their health. In one village, a new road and deforestation meant increasing mosquitos, rising malaria, and the loss of access to traditional medicinal plants. Another village described how runoff from a nearby mine that closed years ago still caused skin rashes while bathing as well as devastation of the adjacent coral reef, which has forced them to travel farther to find fish as well as clean drinking water.

This brief expedition re-highlighted the diverse and profound health and conservation needs of these communities. It was not just we who believed these issues were linked, but the communities themselves who described the connections between their own health and that of the reefs and forests. Our work continues and our hope is to someday bring Health in Harmony's holistic model to Raja Ampat.

No longer a medical student and barely a new physician, I am still shaping the way in which my role as a healer can have a greater impact in the world and on the issues I am passionate about. Instead of only focusing on saving lives or only saving coral reefs, I challenge myself and others to ask: could we not instead do both? Could our stethoscopes also help save the natural ecosystems on which our health depends? 

Camia Dimock is a first-year family medicine resident at Maine Medical Center in Portland, Maine. To learn more about Health and Harmony's work in Indonesia, visit www.healthinharmony.org.

OPINION

BY MEGAN RANNEY, MD, MPH RES'08 F'10



Local artist Boris Bally's "Gun Totem" (30 x 36 x 144 inches, 3,500 pounds, 2001) stands on South Main Street in Providence, across from the Licht Judicial Complex. The sculpture is composed of roughly 1,000 disabled guns reclaimed by a Pittsburgh gun buy-back program from 1999 to 2001. The guns were embedded in concrete that was carefully chipped away in areas to reveal the "fossilized" handguns beneath.

A Call to Action

A physician speaks on gun violence, public health, and medicine.

It has been almost a year since Newtown. We have mourned from a distance, imagining the heartbreak. We have asked ourselves what we would have done were this our community, our school, our child. We have formed opinions about what may, or may not, have stopped this tragedy. And we have each quietly recalled other tragedies that we have witnessed.

Now it is time, as individuals and as a profession, to take action.

First, a review of the facts. Although mass shootings such as the Newtown massacre generate the greatest public attention, firearms killed almost 32,000 American civilians last year, and seriously injured another 74,000. The rate of firearm-related death for children younger than 15 years of age is nearly

12 times higher in the United States than in other industrialized nations. Our overall firearm-related death rate is 7.5 times higher than in the world's other 22 high-income countries. Studies show that the presence of a gun in the home is associated with a significantly increased risk of homicide, suicide, and accidental death. Women whose partners have guns are at the greatest risk of being killed due to domestic violence. Overall, firearm injuries cost the US more than \$70 billion a year in medical expenditures and lost productivity.

As physicians, we know that we can act collectively to prevent injuries such as these.

Physicians have a long history of advocating for public health and community well-being while respecting individuals' rights. Our work in highway and auto safety, for instance, has helped to reduce US automobile fatalities by 31 percent without limiting access to automobiles. We have been instrumental in decreasing the rate of pediatric poisonings by advocating for child-resistant caps; reducing childhood drowning by advocating for laws regulating pool fencing; and developing reporting standards for child abuse, partner violence, and elder abuse.

Unfortunately, while these successful public health measures came directly from careful and comprehensive research, we are limited in our ability to make evidence-based recommendations regarding firearms. Since 1996, the Centers for Disease Control and Prevention has been banned from using funds to "advocate or promote gun control," a thinly veiled threat that led to an absence of federally funded research on

ERIKA SMITH

the nature, causes, and potential prevention of firearm injuries. In 2011 this limitation on the development of scientific data was extended to include the National Institutes of Health. Although this ban was in theory lifted by President Obama's January 16, 2013, executive order, Congress has yet to appropriate any money for firearm research.

that keep physicians from raising health concerns with their patients are unethical and dangerous.

3. Improved access to mental health services.

While the mentally ill are more often victims than perpetrators, those with violent tendencies can be prone to unspeakable acts. A lack of access to men-


In Rhode Island, many physicians and medical groups are actively working to influence state-level legislation on background checks and other gun safety issues. Get involved!

2. Ask your high-risk patients about firearm possession, and counsel on safe handling of guns.

Part of the assessment of suicidal, psychotic, and violent patients should include questions about firearm access or ownership. Counseling of parents should include safe storage of handguns.

3. Develop partnerships with local community groups and law enforcement officials.

We should consistently raise the issue of gun violence when interacting with police officers, domestic violence advocates, mental health providers, emergency medical services personnel, and other groups. These individuals are valuable partners in our quest to make our communities safer.

Change is hard to come by and harder still to make. Frequently, tectonic events must occur for change to be possible. Since the Newtown massacre, our society and our specialty have reawakened to this grave public health crisis. It is time for us to act, in the best interests of our patients and our communities. 

Megan Ranney is an assistant professor of emergency medicine at Alpert Medical School and an attending physician at The Miriam Hospital and Rhode Island Hospital. This piece was adapted from "A Call to Action: Firearms, Public Health, and Emergency Medicine," which appeared in June in *Annals of Emergency Medicine*.

Physicians have a long history of advocating for public health and community well-being.

Worse yet, in Florida, the legislature passed HB 155 (currently under injunction by a US District judge), a law that subjects physicians to potential sanctions, including loss of license, if they discuss or record gun safety information with their patients. Even the Affordable Care Act contains language [subsection 2717 (c)] that limits the ability of physicians and researchers to gather data on patient gun ownership.

In the face of these facts and limitations, it is critical that our profession speak out in favor of:

1. Immediate restoration of funding for research on firearm-related injuries.

Research is a *sine qua non* for the success of public health measures, and efforts to reduce gun injuries must be based on comprehensive and sound science.

2. Protection of the First Amendment rights of physicians.

Physicians have sworn an oath, and we consider the doctor-patient relationship to be sacred. So do our patients. Policies

that keep physicians from raising health concerns with their patients are unethical and dangerous.

4. Mandatory background checks for all firearm transfers, and an improved system for enforcing background check restrictions.

Approximately 40 percent of current firearm transfers avoid the requirement for background checks. Moreover, studies show that even those who should not be able to buy firearms (e.g., those who have a current restraining order) can and do evade the system, due to loopholes in reporting requirements. Law-abiding gun owners and society at large will benefit from fewer firearms in the hands of those who should not have access to them, and from improved enforcement of existing laws.

Individual physicians must also consider the role that we can and should play in shaping the national and local dialogue. For instance, we can:

1. Join the discussion on a local, state, and national level.

PROGRESSNOTES

BY MICAELA HAYES, MD RES'09



Talk Me Down

After a patient's suicide, a doctor wonders what more could have been done.

“You’ll take it personally if I kill myself, won’t you?” he said. This pleasant man and I had spent the previous half-hour exploring his current mood and suicidal thoughts. What started as a routine checkup had quickly evolved into a mental health crisis. I was per-

suading him to get urgent evaluation when he made this striking observation.

About 45 percent of all people who complete suicide see a primary care doctor in the month beforehand. Over the years I’ve returned again and again to this stark statistic, wondering what

that visit looks like to the doctor. Does the patient offer his ideation unprompted? Does the doctor recognize the significance of poor sleep and flat affect and investigate appropriately? Or are the suicidal thoughts passed over, unmentioned, unnoticed, an opportu-

BRIAN REA

nity missed? When I am that doctor, will I pick up on the clues and get it right?

Sadly, I need not wonder any longer. That pleasant man committed suicide mere days after seeing me. I was that doctor.

Like many primary care physicians, I frequently feel like a psychiatrist. In my mostly healthy college student population, depression, anxiety, and eating disorders are fairly common. SSRIs and SNRIs frequently populate my patients' medication lists. It is a rare clinic day that "fatigue" or "sleeping troubles" doesn't develop into a DSM diagnosis. Many of these patients describe suicidal thoughts. Most are passive: "It would be easier if I could just go to sleep and not wake up." Most have never even thought of a plan.

And yet—even this early in my career—a startling number of my patients describe worrisome thoughts and histories: one ponders driving into the woods and using his shotgun; another overdoses on pills after fighting with family; one scours the Internet for pain-free strategies; another's girlfriend found him with loaded gun in hands; one thinks about jumping from buildings or in front of buses; another actually tried to jump in front of a bus. Even after proper supports are in place, I lie awake at night worrying about these patients, scared I will be greeted the next day with tragic news.

So it was with my patient. When it became clear that mood was a problem, I asked all the "right" questions: planning, intent, access to means, reasons to live, future planning, etc. When the answers worried me, I arranged emergency evaluation and followed through afterward

to make sure supports were in place. It seemed everything was going to be OK.

And then it wasn't. This life, full of promise and potential, was ended in a heartbeat by an ounce of lead traveling 2,000 feet per second.

IT'S PERSONAL

I am trying hard not to take it personally that my best efforts proved inadequate in the face of his illness. What if I had asked different questions? Would I have gotten closer to the truth about his access to firearms? What if it were harder for him to get a gun? Would he have been deterred long enough for the urges to subside? What if policymakers hadn't shackled public health research on gun safety for the past 20 years?

About 45 percent of all people who complete suicide **see a primary care doctor in the month beforehand.**

Would we have evidence-based policies in place that could have prevented my patient's suicide?


Would hospitalization have stabilized his mood or merely postponed the inevitable? What if we knew better how to predict who will attempt suicide? What if we had a robust mental health system where patients could actually access therapy, psychiatry, and substance abuse treatment when needed?

My actions failed to avert a tragedy; does this mean that I have failed? Should I take it personally, that is, as a reflection on my conduct, character, and motives?

My patient shared his observation with bemusement and a touch of wonder that I—who had just met him—could so sincerely care that I would take his suicide to heart. How could I not? I became a physician to positively impact people's lives. I like to believe that the opportunity to act means that my actions can alter the course of events.

I choose to take his suicide personally so that I can hold it close and keep it near me as I care for other depressed and suicidal patients. He was with me this week as I persuaded a patient to be hospitalized. He was with me this past month as I closely followed a chronically suicidal patient who has steadily improved with medications. He is with me every time I ask patients about suicidal thoughts.

His memory keeps me motivated to be ready for the next patient who graces my office in that critical month leading up to a suicide attempt. I have to be ready to recognize the clues, establish the rapport, ask the questions, and provide the supports.

Next time it might work. 

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.



Dean Jack Elias, MD

INTERVIEW BY KRIS CAMBRA
PHOTOGRAPH BY SCOTT KINGSLEY

SKY'S THE LIMIT

Accomplished physician-scientist, leader in academic medicine, and Institute of Medicine member, Jack Elias adds “dean of medicine and biological sciences” to his lengthy CV.

JACK A. ELIAS, MD, is certainly the only dean of medicine and biological sciences at Brown—maybe the only faculty member—born in Arkansas. One of six children, his parents moved from Fayetteville, AR, to New York City before landing in Pennsylvania. Elias grew up mostly in the Keystone State, and stayed there for undergraduate and medical school at the University of Pennsylvania. He ventured to Boston for internship and residency, and then completed his residency and fellowships at Penn. He ended up with four sets of boards: internal medicine, pulmonary, critical care medicine, and allergy and immunology.

Elias stayed on the faculty at Penn until 1990, when he moved to Yale to be chief of Pulmonary and Critical Care Medicine. After nearly a quarter-century in New Haven, he decided to take on the deanship, moving to Providence with his wife, Sandy. He talked to *Brown Medicine* about his background and offered some insights into Alpert Medical School.

How did you choose your specialty?

I went to medical school thinking I was going to be an orthopedic surgeon or pediatrician. I decided not to do pediatrics because I found it very disheartening when kids are sick. However, when I did my medicine rotation it just seemed like the right thing for me.

I never expected to be research focused, but during my fellowship, I did research and I really liked it. I found the idea that I could discover something that no one else knew very exciting. Thus, I became an internist with specialty training and a physician-scientist.

Do you want to talk about your research?

I always want to talk about my research—it's like talking about your children! My research is focused on the molecular and cellular mechanisms of lung injury and repair. We like to define pathways of injury and pathways of repair in the normal lung, and then we see how these pathways are operating or not operating in the diseased lung. We tend to work in *in vitro* or *in vivo* animal systems and we quickly jump from those to human tissues and human samples. I like to refer to it as “from mouse to man to back again.” We will generate a concept in the mouse, and it will give us a hypothesis to test in humans. We then go as far as we can in humans, until we have to go back to the mouse to generate the next hypothesis or question.

We started out studying some very basic things. We developed the techniques that allow us to take any gene and selectively express it in the mouse lung in a transgenic fashion. One of the things we've gotten good at over the years is de-

veloping ways of taking a gene, expressing it in the lung, and finding out how the lung has changed. You can generate a transgenic mouse and compare it to a control wild-type mouse. The difference between the two is the effect of the gene. You can get a lot of important information by using these systems to ask very basic questions like: what does this gene do? Does this gene cause alterations that look like a human disease? By doing that we have defined many of the major pathways involved in asthma, emphysema, and in pulmonary fibrosis. These pathways are now being targeted by pharmaceutical companies to develop drugs that will block pathways, or augment pathways. Thus, we use this approach to identify and validate a therapeutic target.

For some of the pathways we defined early on, in the 1990s, the drugs that target them are just now going into human trials and some of them look promising, which is quite exciting.

At the same time, you saw patients living with these diseases.

Yes. The key to the whole system is to have the most state-of-the-art model of the disease, but you also want to have well-characterized human populations. Having a well-defined patient cohort and appropriately biobanked serum, plasma, biopsy, DNA, RNA, and other samples allows one to discover something in a model and very quickly define its relevance in humans.

Could you talk about the administrative roles you've held?

For 15 years I was chief of Pulmonary and Critical Care Medicine at Yale. It was

a wonderful, fun time. Then about seven years ago I became chairman of the Department of Medicine at Yale and Yale-New Haven Hospital.

I took over the department when it was in need of an overhaul. I had the opportunity to recruit eight new section chiefs. We grew the research program by approximately 90 percent and we grew the clinical program by approximately 140 percent. It was a lot of work, but it was a lot of fun. The department almost doubled in size and reached new levels of research, educational, and clinical excellence.

What was the key to that success?

A variety of things, but the key to any department is the people. We were blessed to have wonderful people who worked very hard at what they did. We were also able to empower them to do great things. At the same time, the medical school and the hospital were committed to making each other stronger. As they grew, we grew. Everybody helped everybody else. When the leadership of the medical school and hospitals are working together, magical things can happen.

What made you interested in coming to Brown?

I'll put it this way: my daughter is in the acting world—she's an actress and has her own newly formed theater company in Boston. She would say to me, “Dad, you have one more major act left in your play.” So, the question is, what do you want to do? The idea of coming to a great medical school and having a small hand in making it even greater was very appealing. Brown is a wonderful place, and it's a place that can be even better,

so it seemed like a great thing to dedicate my passion to.

What do you think are the challenges that the Medical School must overcome?

A big part is getting the relationships with the hospitals right, and that comes at a number of levels. The Medical School has to be committed to the growth of the hospitals, and the hospitals have to be committed to the growth of the Medical School. They have to be equal partners and they've got to work to make one another grow. If Brown can do that, then the sky's the limit. It's not that easy a thing to do. It takes a lot of time, energy, trust, and patience on both sides.

The other issue here is balancing the different health care systems. Most places have one health care system and one medical school. There are no questions about where you are going to do something or who you are going to partner with to do it. At Brown, all of the partners here bring special things to the table. We need to work to have it integrate properly.

The other big challenges relate to the fact that science is changing, health care economics are changing, the way we practice medicine is changing, and the way we teach medicine is changing. The Affordable Care Act may revolutionize the economics of health care. The importance of primary care may go up and other things that had been at the top of the health care financial world may no longer rule the roost. In addition, medicine and science are increasingly team sports, much more than a decade ago. As a result, how we teach needs to change to meet these challenges.

What are the issues given the current research funding environment?


The National Institutes of Health wants research that goes, in an integrated manner, from basic science discovery to human translation at the bedside to societal application. To be competitive we will need to have programs that allow for this sort of research integration and continuity.

Where do you think science and medicine are going?

We live in a very exciting time. For decades we have had little glimpses of what was going on in many diseases but, in reality, did not know very much. However, with the cellular, molecular, and genomic revolution, we are on the verge of having detailed scientific knowledge about disease pathogenesis. This has given us the infrastructure that we need to develop new treatments that can change how we treat people in the not-so-distant future. If the funding of the NIH allows this progress to continue, I am confident that we will see amazing progress in the years to come. One of my jobs is to join the faculty in conveying this excitement to the Medical School and the undergraduate, medical, and graduate students. I'm trying to convey the idea that if every physician and biologic scientist does something that changes how we think about one disease or how we care for one disease, think of where we'll be 20 years from now. The saddest thing, to me, is to see a patient and realize that the treatment that we're giving this person has not changed in 20 years—and it was not very effective 20 years ago. On the other hand, it is very

exciting to see a patient who has a disease that was an untreatable disease 20 years ago but is now treated effectively. That puts a smile on my face and embodies what makes academic medicine unique and wonderful.

You've mentioned how quickly medicine is changing. How will you ensure that the medical students are prepared for this?

Brown is already on the cutting edge in primary care and comprehensive care. Although no one really knows exactly how things will change, Brown is already doing unique things that will get the students ready to meet future challenges. A funny event happened this summer that helped convince me of this. My wife and I went to Acadia National Park to do some hiking and charge our batteries before moving to Providence. One day we took the mail boat from Mt. Desert Island to Great Cranberry Island. When you're a day tripper to this island, you sit next to the mail bags on the ride over, and the local folks meet you at the pier. They put you in golf carts and show you the views. Our golf cart was driven by a spry 85-year-old who was a Columbia professor who had spent his last 38 years summering on the island. I told him I was in medicine, but I didn't tell him what I did. As he drove, he told me that the best students he ever had in his lab were from Brown and that if it wasn't for Brown, the state of Maine wouldn't have any primary care doctors. When I told him that in a week I was going to be the dean at Brown he was very excited. For about 15 minutes I was treated like a rock star because of the legacy of Brown's students. 



**GAME
CHANGER**
Concussion
ended Alyssa
Blood's basket-
ball career, but
touched off
an interest in
neurosurgery.

AHEAD OF THE GAME

The best defense against concussions is a good offense—
a multiplayer strategy that involves research, tougher policies,
and better treatments.

AT SIX FOOT ONE, Alyssa Blood '11 looks like she was born to play basketball. Lean and fit, a multisport athlete at the American School in London, she excelled on the hardwood, and was named team captain and MVP. When she was recruited back to the States to play for Brown, she finally achieved her goal of playing on a college team. But then a wayward ball turned that dream into a nightmare.

In Blood's first year in Providence, another player bumped into her during a game, knocking her down, and the back of her head hit the court. "My mom could hear it across the stadium," she says. It was her third concussion—she'd suffered two in high school, one playing tennis and the other in softball—and she was sidelined for six weeks. But, she says, she "recovered well."

Less than a year later, as she was run-

ning off the court before a game, a ball slipped from a teammate's hands and slammed into the side of her head. It was the beginning of a prolonged ordeal, and the end of her basketball career. "I really struggled to recover," Blood says. "I was very sick for two and a half years. I was pretty much bedridden."

The thousands of concussions sustained each fall on football fields across the country have shined the media spot-

light on the dangers of that sport, as have recent class action lawsuits alleging the NFL and NCAA didn't protect their players. But millions of other athletes, like Blood, put their brains at risk every time they step onto a court, jump in a pool, or hop on a bicycle. "Concussion is the most prevalent sports injury," says Neha Raukar, MD, assistant professor of emergency medicine. "Every soccer mom knows about it."

Yet there is also a harmful amount of misinformation, among the public and doctors alike.

A GROWING CONCERN

In a concussion, the brain strikes the skull wall after a sudden blow to the head or, sometimes, a violent shaking, as in whiplash. The damage happens at the cellular level, often due to rotational forces twisting or tearing brain cell axons, causing the brain to swell. For most patients, that swelling subsides in less than two weeks. But for reasons researchers don't yet understand, the recovery time

ON THE FRONT LINES: Richard Ellenbogen, speaking at Reunion, says Seattle Children's Hospital, where he's on the neurosurgery staff, sees 1,000 kids each year with concussions.



for patients who have sustained at least one prior concussion is double or more that of patients suffering their first—something Blood learned the hard way.

Sports-related concussions are a serious concern; experts say estimates of 300,000 annually in the US are almost certainly too low. The Pentagon has said a roughly similar number of veterans experienced at least one concussion while serving in Iraq or Afghanistan, often due to blast exposure. But these figures pale in comparison to the 1.6 million to 3.8 million sustained annually in falls, traffic accidents, and assaults. “Anyone is susceptible to suffering a concussion,” Blood says. “Certain activities increase the likelihood, but you can slip on the ice—there’s still a chance you can get hurt.”

Not even wearing a helmet all the time would protect our delicate brains if they’re ricocheting around our crania. J.J. Trey Crisco, PhD, the Henry Frederick Lippitt Professor of Orthopaedic Research, uses an egg as an analogy: “it’s still jiggling around, but you can only protect the shell, not the yolk inside.” So if the head moves suddenly, the brain will, too, and won’t stop until it collides with the bone encasing it.

Crisco, who studies sports-related head impacts among Brown and other schools’ athletes, has a longstanding professional interest in protective sports equipment. An athlete himself, he plays lacrosse on a master’s team and sits on the US Lacrosse Sports Science and Safety Committee. In high school and college he wrestled and played foot-

ball—and sustained three diagnosed concussions, blacking out in one of them. He notes that the injury’s definition has changed since then.

“When I was playing, a concussion was if you were foaming at the mouth or unconscious,” Crisco says. “Now it’s any altered cognitive state of several seconds or more.” Symptoms can appear immediately or hours, even days, later and range from sleep difficulties and fatigue to dizziness and nausea, but rarely loss of consciousness.

Improved diagnosis and greater awareness may account for the exponential increase in concussions among Brown athletes since 1979. That year, when Russell Fiore, MEd, ATC, joined the University, his staff recorded just five concussions. Last year, the head athletic trainer says, there were 81.

Fiore says that, in retrospect, some of the “helmet headaches” football players reported three decades ago were probably due to concussions. But his staff was keeping up with current treatments. “I always thought we were doing the right thing,” he says. “We always had the best protocols. But medical philosophy changes with time—knowledge is getting better. As the science changed, we have always changed.”

DO THE RIGHT THING

Raukar is one of two specialists who work with Brown Athletics to diagnose concussed athletes, monitor their treatment, and determine when—and whether—they return to play. In addition to concussed Bears, Raukar sees patients of all ages at the Center for Sports Medicine in Riverside, RI, which is affiliated with the Rhode Island Concussion

DAVID DELPOLO

CHECK YOUR HEAD: Neha Raukar is a concussion specialist at the Center for Sports Medicine in Riverside, RI, which treats most of the concussions in the state.

Management Consortium. “It’s a special injury to treat,” Fiore says. “It’s easy to mismanage. ... If you need an ACL reconstruction, you don’t want to go to a doctor who does one a year. You want to go to a doctor who does four a day. It’s the same with concussions.”

Raukar, who offers a well-attended lunchtime lecture on the topic for first-year Alpert medical students, recalls athletes at her clinic who had been diagnosed with concussion and told by their pediatricians that they’d be back in the game in a week. “You can’t tell from the initial presentation how long recovery will take,” she says. “There is no crystal ball that can predict when someone will be better.”

Because there’s no physiological measure of concussion, such as medical imaging or a blood test, diagnosis relies on reporting by patients, who may ignore symptoms that, at first, seem minor. But the age-old advice to “shake it off” isn’t just bad medicine: it can have long-term, even catastrophic, consequences. In the extremely rare second-impact syndrome, a brain that sustains two concussions in a short timeframe—within hours or a couple of days—will swell beyond the confines of the skull and into the spinal cord, resulting in coma, severe disability, or, in about half of known cases, death.

Rest, physical and cognitive, is the cornerstone of a full recovery. Just as Raukar tells her patients to slowly add more activities as they work to return to play, she prescribes a gradual increase in mental exertion, which includes schoolwork and activities like reading, watching TV, playing video games, and texting. But “return to learn,” as Raukar



REST, PHYSICAL AND COGNITIVE, IS THE CORNERSTONE OF A FULL RECOVERY.

calls it, slows overall recovery, which can be frustrating. “The point of a student athlete is he needs to get back to school,” she says. “An NFL player needs to get back on field; he’ll power through. If you’re a student and your first goal is school, you can’t power through your exams with a massive headache.”

Most patients who follow doctors’ orders get better in one to three weeks; those who suffer symptoms for months or years are few. Blood acknowledges that she didn’t rest enough. “I didn’t take time off from school,” she says. “I probably should have. I probably would have gotten better faster.” Hoping to rejoin the basketball team her senior year, she worked to get back in shape the summer before. But she was still sick, suffering constant headaches and mental foggy, and was never cleared to play. She credits Fiore and others for helping

her to finally recover, and she graduated on time, with a double concentration in art history and international relations.

Her long struggle changed not just her athletic dreams but her career focus as well. Blood has actively promoted concussion awareness, speaking on panels and to the media. After completing the postbaccalaureate program at Georgetown University, she enrolled at the University of Colorado School of Medicine this year. She hopes eventually to practice neurosurgery and help other athletes. “It wasn’t what I thought I’d ever do,” she says. “Everything happens for a reason.”

SAFETY FIRST

Elizabeth Jacobs, MD RES’00, clinical assistant professor of emergency medicine, regularly diagnoses and treats concussions at Hasbro Children’s Hospital,



where she directs the pediatric emergency medicine fellowship. She's disturbed by the number of young children she sees—as young as 7 years old—who sustain head injuries while playing contact sports. At such early ages, their brains are still developing and can repair themselves. But, she adds, “no one knows what long-term cognitive damage has occurred.”

Some of the most frightening concussion-related news reports involve chronic traumatic encephalopathy, or CTE, a disease that has been diagnosed in several dozen deceased football players, boxers, and other athletes who had suffered repeated head injuries. According to Boston University's Center for the Study of Traumatic Encephalopathy, the brain tissue degradation they found in these individuals caused cognitive disabilities later in life, including symptoms reminiscent of Alzheimer's, as well as depression and suicide. Because the disease can only be seen on autopsy, dozens more athletes, veterans, and others—including Arizona Cardinals wide receiver Sean Morey '99, who retired from football after more than 20 concussions—have

agreed to donate their brains to further the center's studies.

Researchers at Brown caution that the data do not yet support the assertion that permanent cognitive damage is an inevitable consequence of repeated concussions. But it's the unknowns that worry them, especially regarding children, who appear to be more vulnerable to post-concussion symptoms, and take longer to recover, than adults; furthermore, all cases of second-impact syndrome have been in kids.

Safeguards for youth players are years behind the rules now being enforced for the pros. Richard Ellenbogen '80 MD'83, P'11, chair of neurological surgery at the University of Washington and co-chair of the NFL Head, Neck and Spine Medical Committee, an unpaid position, spoke passionately at Reunion 2013 about the need for more education and legislation to protect student athletes. The NFL now requires players with suspected concussions to be pulled from games or practices until they're cleared by both a team physician and an independent TBI expert, in accordance with the new mantra, “When in doubt,

sit them out.” “It should be no different for anyone under 22,” Ellenbogen said, yet changes only “trickle down” to youth and college sports. (He did, however, commend Brown Athletics for being ahead of most of its peers.)

Jacobs says that, whether or not the NFL obscured the risks of head injury—a question left unanswered in August when the league settled the suit by 4,500 former players—a pro can make informed choices about when and whether to play, but a child can't. “It's up to parents and coaches to protect that kid's head,” she says.

Having treated too many concussed kids in the ER—and been confronted by too many adults antsy to get them back on the field—Jacobs and Raukar banded together with other advocates to push passage of a state law in 2010 that mandates concussion education for players and coaches, that any youth athlete suspected of sustaining a head injury be removed from practice or competition, and that he or she may return to play only with a physician's written clearance. Jacobs and Raukar, who also sit on the Rhode Island Interscholastic League's

NO BRAINER: Though crash test dummy heads are helpful for head impact research, Trey Crisco says that for now, collecting data from athletes who've suffered concussions is the best way to improve helmet design.

sports medicine advisory committee, helped write the law's best practices, which they update as the science evolves. Since 2009, 47 states and the District of Columbia have passed similar legislation.

Alpert medical students are aiding the Rhode Island law's educational component. Linda Chao MD'15 started the School's chapter of Sports Legacy Institute Community Educators, of which Raukar is faculty adviser, to raise awareness about concussions among youth athletes. Group members speak on panels and at other local events to teach students about concussions. "So often people think if you're hit in the head it's something you should just shake off,"

Chao says. She speaks from experience: as a cheerleader at Harvard, she fell from the third tier of a stunt and landed on her head. "I shook it off, drank some water, ran a lap around the track, went back, and did the stunt again," she says. "Not the smartest idea." But the med students try not to scare their young audiences with graphic stories of dead and debilitated athletes. "We need to figure out ways to make people safer without changing what people like about participating in sports," she says.

Raukar also sits on the Institute of Medicine's Committee on Sports-Related Concussions in Youth, which is examining, among other things, long-term risks,

equipment effectiveness, and diagnosis and treatment. The committee's report, scheduled for release around Halloween, will offer recommendations to schools, legislatures, equipment manufacturers, and funding agencies, and identify areas that require further study—taking particular aim at research regarding long-term effects. The committee also analyzed the science behind commercially available devices like padded headbands and impact-sensing skullcaps and their claims that they protect athletes' brains.

"In the wake of the [NFL] settlement, companies will prey on the fears of parents everywhere with their 'concussion-proof' helmets and accessories," Raukar wrote in a commentary in late August. "As a society, before we make laws, create and market safety products, or settle lawsuits, we should be very clear on the science behind the hype."

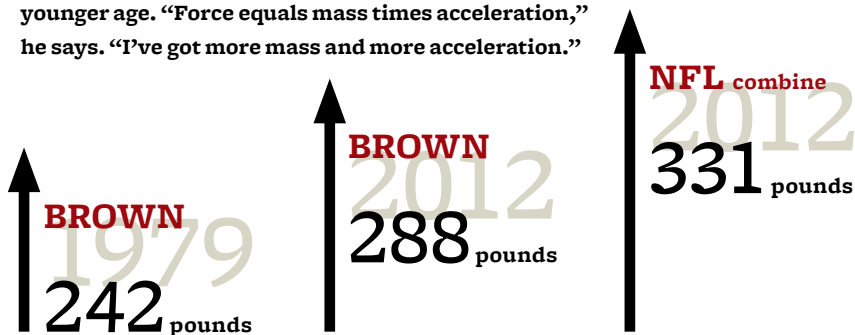
BRAIN POWER

Dramatic improvements in helmet technology have done little to protect players' brains, as the skyrocketing number of helmeted, concussed football players attests. "For a helmet to prevent concussion," says Fiore, holding his hands at arms' length on either side of his head, "it needs to be this big."

A helmet may dampen the force of a blow to the head, but the three-pound organ inside is defenseless. Helmets are designed to prevent skull fracture or hematoma, which are forms of moderate and severe traumatic brain injuries, or TBIs. Known technically as mild TBIs, many concussions are anything but. "TBI is the No. 1 cause of disability in kids, and 75 percent of all TBIs are concussions," Raukar says.

DO THE MATH

Football players are significantly larger and faster now than they were when Brown head athletic trainer Russ Fiore joined the athletics staff 34 years ago. They're also training more than they used to, he says, and they're starting at a younger age. "Force equals mass times acceleration," he says. "I've got more mass and more acceleration."



Average weights of offensive linemen

HEAVY HITTERS: Both Trey Crisco's lab (shown here) and Christian Franck's lab have heavily abused crash test dummy heads to study head impacts and helmet safety, using everything from lacrosse sticks to steel balls.

Fiore says half a dozen researchers contact him every year to study concussions in Brown athletes. "Everyone is trying to find the holy grail here," he says, "what is it, how to define it, what's the best way to treat it." In 2004 Crisco joined their ranks. He approached Fiore and the head football coach, Phil Estes, about equipping players' helmets with sensors that would record head impacts, hoping to determine whether the number of blows, among other factors, could predict risk of injury to the brain—even when they didn't result in concussions.

According to Crisco, one unknown in CTE research is the correlation between exposure and brain damage. Nonetheless there is reason for concern: any knock to the head, of any severity, is a subconcussive event—and football players may suffer several in a single game. "That cumulative effect may lead to a diagnosis of concussion," he says. And yet one study found that, while players who sustained repeated head impacts demonstrated decreased cognitive measures over the course of a football season, by the time they came back the following fall those levels had returned to normal. "What does that mean?" he asks. "And what does it mean in the long term?"

To find out, Crisco first quantified player exposure, working with Stefan Duma, PhD, at Virginia Tech and Rick Greenwald of Simbex, inventor of wireless sensors called the Head Impact Telemetry, or HIT, System. Crisco developed an algorithm for the HIT System to measure how hard, how often, and where on the head football players were struck when the sensors were placed inside their helmets. The study, funded

by the National Institutes of Health's National Institute of Child Health and Human Development, documented hundreds of thousands of head blows over three seasons at three universities, and could ultimately help doctors better understand the relationship between head impact and injury. But making long-term conclusions is another story.

"NIH grants last only five years," Crisco says. "How long do you have to follow players to have results? How do you tease out other factors, like lifestyle?" Nor can blanket statements about cause and effect be made of an injury that's so individualized. "There's variability across players in how each impact affects each one," he says.

Assistant Professor of Engineering

“WHAT IS THE WORST THAT CAN HAPPEN? THEY SIT OUT A GAME.”

Christian Franck, PhD, is trying to bypass those individual differences to understand concussion at the most basic, and universal, level: the cell. "There are anatomical differences from person to person," he says. "The shape and thickness of skulls are different, the amount of gray and white matter is different. So we start with the smallest unit, the cell, which is the same for everyone."

The research is multifaceted: first Franck is smacking a crash test dummy head—outfitted with different helmets and padding and wired to the HIT System—with a steel ball, and then he's correlating that impact data with work he's doing at the microscopic level. "I'm looking at how mechanical forces from

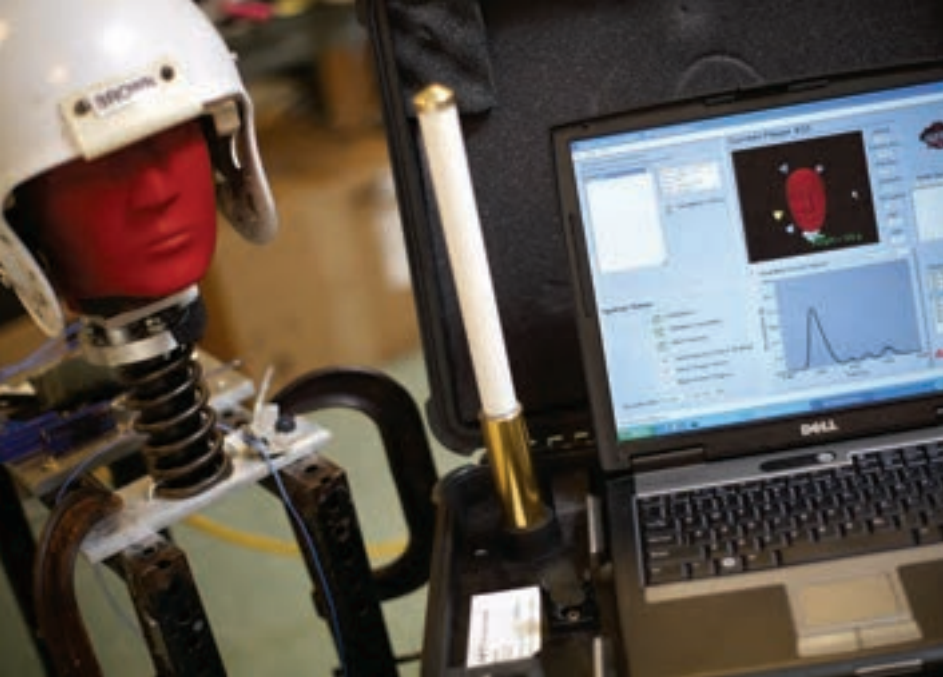
an impact are transferred to neurons and how they respond," he says. "How much force and energy can they take before they start to malfunction, and where in the brain does it take place?"

Franck is collaborating with Team Wendy, a US military helmet padding manufacturer, to take these findings to the next level: a computer simulation that could, using HIT System and cellular data, diagnose a brain injury. Such a device could send results to the sidelines in a football stadium—or up to a mile away, to a medic on the periphery of a battlefield. Unraveling the cellular mechanics of concussion could also help other researchers pinpoint therapeutic targets and develop a drug that could treat it, he adds. "Everything has a

window of opportunity," Franck says. "We need to know when, not just what, to target."

Brown is a big place, and concussion is a big, interdisciplinary problem. Franck, who's been on campus four years, says it's his "personal mission" to bring together the University's disparate researchers in the field. He's collaborated with Crisco on the HIT System algorithm for his work at the cellular level, and he's thrilled that at Rhode Island Hospital, another faculty member is working on an experimental drug treatment for TBI that might someday help concussion patients too.

Lisa H. Merck, MD, MPH, assistant professor of emergency medicine and



diagnostic imaging, is the local site leader for a national study that uses progesterone, a naturally occurring hormone, to reduce edema and cell death within a few hours of a head injury. “After moderate and severe TBI, the brain is vulnerable to swelling and secondary injury,” she says. “The patient needs medical intervention as soon as possible to reduce inflammation and further injury.”

Merck, who was recruited to Rhode Island Hospital to help develop the neurological emergency research program, also studied concussion treatment at Grady Memorial Hospital in Atlanta. She wants to resume that work, and calls progesterone treatment for concussion “a potential area for future research”—but there are too many unknowns. “We’re still trying to define concussion,” she says. “It can be a very elusive phenomenon.”

Elusive—or just very, very hard to see? The tireless Crisco, with Peter Quesenberry, MD, the Paul Calabresi Professor in Oncology and professor of medicine, and Curt LaFrance, MD, MPH, assistant professor of psychiatry and neurology (research), are betting on the latter. They believe vesicles—tiny bubbles of proteins or chemicals that cells expel into the body—may be released by brain tissue into saliva after a subconcussive blow. They’re seeking grant funding to analyze football players’ spit for vesicle number, size, and molecular

content, before and after games, and correlate it with data from Crisco’s sensors and neurocognitive testing administered by LaFrance. The data could help monitors on the sidelines pinpoint hard hits and remove athletes from play before more severe injuries can occur.

Other biomarker research has looked for indicators in the blood and focused on concussions, Quesenberry says. Subconcussions are asymptomatic and, as such, aren’t currently monitored. “Detection may be a big factor for a number of diseases later on,” he says. If their theory pans out, Quesenberry—a former amateur boxer, who hung a framed 1965 photo of Muhammad Ali and Sonny Liston in his office at Rhode Island Hospital—says their findings could enhance treatment of stroke, Alzheimer’s, and Parkinson’s, the disease that ultimately knocked Ali out of the ring.

“It’s novel, it’s exciting,” Crisco says of the proposal. “We don’t know if it will work.”

USE YOUR HEAD

Many sports, from pro and college teams to peewee leagues, have instituted rule changes to protect athletes’ heads, limiting full-contact practices and banning moves like spearing in football or heading the soccer ball by players under 12. “These rule changes are not off the cuff. They’re steeped in a lot of science,” Raukar says. “There’s volumes of

evidence to support them.” Yet changes have sometimes been slow to come, for fear that fans will drop away. “Are the majority of fans there for the fights or the violence?” she asks.

At Reunion, Ellenbogen reminded his audience that football has changed significantly since its early, bloody days. “The NCAA was born to protect students playing football,” in 1906, he said, due to the “staggering death toll” on the gridiron of up to 26 players a year. “Can we change collision sports?” he asked. “Sports make kids healthy. They teach them teamwork.” Chao, who enjoys watching football, echoes the sentiment. “There are ways to make games safer without fundamentally changing them,” she says. “One way to do away with concussions is to do away with all contact sports, but no one wants that to happen.”

Were those sports banned, concussions wouldn’t stop: klutzes would still hit their heads, kids would still clown around. Jacobs recalls treating two little boys in the ER who had donned football helmets and then hurtled into each other, heads down like battering rams. Both sustained concussions. In the absence of the concussion-proof helmet or wonder drug, then, the focus will remain on prevention and treatment. “When in doubt, sit them out” is the first, best defense for players of all ages. “What is the worst that can happen?” Jacobs asks. “They sit out a game.”

And if they never get back to the game at all, well, life goes on. “I do as much as I can—running, yoga, pickup basketball, tennis. Basketball is still really important to me,” Alyssa Blood says. “You shouldn’t stop living your life.”

THE WOMAN WHO NEEDED A

ZIPPER

“LAUREN’S BACK AGAIN.”

The gastroenterology fellow groaned. “Lightbulbs this time.” I was in my second year of residency training and had just started working in a major medical hospital as a psychiatric consultant for medical and surgical inpatients. I had no idea who the fellow was talking about. When I told him so, he began to laugh. “Oh, my God. You’ve never seen Lauren? Every time she comes in, the ER docs call us and we call you guys. We all give our advice on how to treat her, but you know what she really needs?” I didn’t. “A zipper,” he said. “See you in the ER.”

I was utterly confused. Lightbulbs? A zipper? Sounded more like supplies for a child’s science project than relevant clinical information. My mind was spinning as I walked through the dingy hospital stairwell to the emergency room to meet Lauren. On the wall at the landing hung a faded hospital-benefit poster of a horse-drawn carriage in the snow and some lines from Robert Frost. Typically

when I walked by the poster, I was working an overnight shift, and so “miles to go before I sleep” had taken on a bleary, fluorescent-lit meaning quite detached from woods, “lovely, dark, and deep.” As I swiped my badge to go into the ER, the lines were still running through my head: *Between the woods and frozen lake / The darkest evening of the year.*

Lauren was in a room across from the nurses’ station. The ER rooms had three walls; the “fourth wall” was a pink-and-tan curtain that could be drawn for privacy or pulled back to enter or exit. Lauren’s curtain was wide open, and a security guard in a navy uniform sat in a plastic chair at the foot of her bed. I took a look in as I walked by. Given the gastroenterology fellow’s dramatic reaction to her presence, I expected her appearance to be notable. It wasn’t. She was sitting glumly on the bed, upright, in a hospital johnny. She was thin. Her dirty blond hair was a little mussed. She was 25, but she looked slightly older. Otherwise

there was not much about her that was remarkable. I continued walking by; I wanted to take a look at her chart before I went in.

As I pulled Lauren’s chart from the nurses’ station, one of the nurses seated there glanced at my name tag. CHRISTINE MONTROSS, MD, it read. PSYCHIATRY.

“Aha!” The nurse smiled and in a singsong voice added, “I know who you’re here to see.”

“The woman in 2B?” I asked. “You know her?”

The nurse nodded and laughed, surprised. “You don’t? I thought everybody knew Lauren. Have fun!” She winked and handed me a folder with the patient’s ER paperwork in it. “Oh, Doc?” she called as I walked away. “Don’t lend her that nice pen of yours.”

I opened the chart. A sheet of Lauren’s orders was on top. Along with the ticked boxes indicating the conventional laboratory studies for ER patients were a few additional specifications: “Finger food diet only,” read one line. Beneath it: “NO objects to be left in room—SEE BEHAVIORAL CARE PLAN.” I couldn’t be sure how to interpret these orders, but from them I surmised that Lauren must be either suicidal or homicidal. Patients who were relegated to finger-food diets were those who could not be trusted with utensils.

Beneath the orders page was a sheet of Lauren’s lab values. I quickly scanned it, looking for the typical irregularities of psychiatric patients: elevated blood-alcohol levels, a positive drug test, sub-therapeutic medication levels, thyroid abnormalities, infection. With the exception of a toxicology screen that was

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*Those wounds
heal ill that men do
give themselves.*

—Shakespeare,
*Troilus and
Cressida*



positive for her having smoked marijuana sometime recently, nothing stood out. Her complete blood count and electrolytes were totally normal. Her pregnancy test was negative. Chest and abdominal X-rays had been taken; the results were pending.

I flipped through the remainder of the paperwork and found that Lauren was already slated for admission to a bed on the internal-medicine service. The admitting resident had seen her and written a note. I deciphered the scrawled shorthand to read: “This patient is a well-known 25-year-old female with extensive psych history and multiple previous intentional ingestions.” Usually an “intentional ingestion” meant that someone had drunk bleach or eaten rat poison or overdosed on pills as a suicide attempt, but the meaning was different here. Lightbulbs. Suddenly keeping utensils and objects and nice pens out of Lauren’s reach made sense. Nobody wanted her to swallow them.

I walked past the security guard and into Lauren’s room. Before I could introduce myself, she glared at me and said, “Let me guess, you’re the shrink, right? I can always tell you guys—you’re all nice-nice handshakes and dipshit smiles.” The security guard, who had doubtless seen a number of ER psych consults, stifled a chuckle and put his fist over his mouth to hide a grin.

“Sounds like you’ve pegged us,” I answered, reaching out my right hand in a nice-nice shake. “I’m Dr. Montross.”

“Yeah,” replied Lauren, glowering at my hand without taking it. “I can read your name tag, *Christine*, but unless you are going to get me something for this pain, I’m not in the mood for a conversation.”

I turned to the security guard. “Would you mind letting us talk alone for a minute?” I asked.

“Whatever you say, Doc.” He shrugged. “I’ll be right outside if you need me.” He stepped out and drew the curtain closed behind him when he left. I slid his chair to the side of Lauren’s bed and sat down.

Lauren pulled the hospital blanket up to her neck, lay down against her pillow, and rolled onto her side, turning her back to me. “Jesus, you people don’t listen. I wasn’t kidding. Unless you give me something for my pain, I’m not talking.”

“Since I’m meeting you for the first time, it’s hard for me to know about your pain. If you tell me about it, maybe we can come up with a way I could be of help,” I offered. It was a stretch—she was talking physical pain, and I was going to try to access her psychic pain—but it didn’t feel like a lie. I knew I wasn’t going to write her an order for pain medication—that was the territory of the ER and the medicine teams—but I needed an entrée, and I hoped that asking about her pain would soften her defensive stance. Or at least encourage her to roll over and look at me. “What’s going on that you’ve ended up in the emergency room?”

“Read. The. Chart,” Lauren intoned, not making a move.

“I’ve looked at it a bit already,” I said, “but I’d actually rather hear from you—”

“Well, I’d rather be left alone,” she interrupted.

“Fair enough,” I said. “Let me just read you what I’ve got here, and you tell me whether that sounds about right, okay?” I opened the chart to the admission note. Lauren was silent. “It says here that you were feeling upset and that

you swallowed some pieces of a lightbulb. Is that right?”

Lauren scoffed, then abruptly turned toward me, angry. “Yeah, ‘upset.’ That’s one way to put it. See? That’s why I don’t talk to you people. I’m in the hospital three days ago, you all decide—you shrinks and the surgeons and the GI docs—you all decide to kick me out even though I’m telling everybody *I’m not ready to go home*, and then some intern writes that I’m ‘upset.’ Well, yeah, I’m upset. I’m upset because I told you I wasn’t ready to go home and no one listened to me. So pardon me if I don’t really buy that you’re so interested in my side of things.”

“What happened with the lightbulb?” I asked.

“Lightbulbs,” she said.

“Okay, what happened with the lightbulbs?”

“I was pissed. I crushed them up and swallowed them,” she said matter-of-factly. “Not the metal part, just the glass and wire.” I nodded. There was a moment of quiet between us. Then she spoke. “Now do you believe me that my stomach hurts?”

I left Lauren and went off to write up my evaluation and recommendations. The surgical team to which she would be assigned consulted the psychiatry service for help in managing her psychiatric medications while she was hospitalized. The team’s larger hope, of course, was that we would be able to provide some sort of intervention that would break the pattern of Lauren’s swallowing, or at least lengthen the periods of time in between her intentional ingestions. To better understand the medications she had been on and the psychiat-

ric treatments she had tried prior to this admission, I pulled her old charts from medical records. She had stacks of them, some of which were more than four years old and so had been archived. I looked up the most recent admissions that had taken place in the last four years; there were 23. Her hospitalizations had been prompted by her ingestion of the following:

- ninety screws
- AA batteries and paper clips
- two knife blades and four fork handles
- four candles
- four metal spoon handles
- screwdriver from an eyeglass-repair kit
- a knife and six barbecue skewers
- a bedspring
- thirteen pencils
- a knife, a knife handle, and a mercury thermometer
- a box of three-inch galvanized nails
- a screwdriver, a ninja knife, and a knife blade
- a steak knife
- a razor and five pens
- two knives
- scissors, pins, and a nail file
- four four-inch pieces of curtain rod
- scissors, a drill bit, and a pen
- a six-inch piece of curtain rod and a seven-inch knife
- a knife, three spoons, and copper wire
- two six-inch steak knives
- a pair of scissors
- a four-inch metal blade, three spoon handles, and a nail clipper

Over and over, Lauren would swallow potentially dangerous objects in the context of stress. She swallowed the screwdriver, the knife blade, and the ninja knife when she learned that her uncle was terminally ill. The two knife blades and four

fork handles were a response to learning that her sister had hepatitis. The box of nails was after a fight with a neighbor. Each time she said she felt better after she had swallowed something and then brought herself to the emergency room for treatment. Over and over, doctors performed endoscopies, threading a camera and tools down Lauren's throat with a tube to try to get the objects out—they hoped before the things she had swallowed inflicted damage on her esophagus, stomach, or intestines. Only once, after she'd ingested a single spoon handle, was endoscopy deemed unnecessary. "She had some discomfort," the discharge summary read, "but the spoon passed normally."

In contrast, once, when an 8-inch knife blade was too dangerous to pull back up through her esophagus and out her mouth, Lauren's abdomen had to be surgically opened and the knife removed. Many times, multiple endoscopic attempts were required to "retrieve" the same object. One endoscopy note read, "Four approximately 4-inch-long sharp pieces of broken curtain rail were found in the gastric fundus. Removal of two was accomplished with a snare. The other two could not be removed. They kept holding up at the GE junction despite two hours' manipulation." If objects could not be extracted, more experienced doctors were brought in for additional attempts. A senior physician developed a reputation for being able to retrieve items Lauren had swallowed when others had failed to do so. Once, during a hospital meeting that had specifically been convened to discuss Lauren's care, an administrator asked the gathered group of clinicians for ideas

about a systematic approach for treating her during her recurrent admissions. A GI fellow piped up from the back, "If at first you don't succeed, try, try again. If you still don't succeed, call in Dr. Freidrichs." ...

The most common category of self-mutilation—with sufferers found across the globe and in every socioeconomic class—is the superficial/moderate type. Though Lauren's chronic swallowing of objects seems neither superficial nor moderate, it is into this group that she and her symptoms fall. In her company would be a comparatively tame crowd who compulsively pull their own hair, bite their nails, and scratch their skin. Others, with symptoms more analogous in severity to Lauren's, repeatedly cut and carve their skin, burn themselves, stick needles into their bodies, and break their own bones. Burning and cutting are the most common types of self-injury, with experts currently estimating that as many as 2 million Americans intentionally engage in those particular acts each year.

For many of these 2 million, occasional, episodic self-harm becomes progressively more frequent, reinforcing an unhealthy feedback loop in the brain. A person turns to self-injury, and the act of cutting or burning or swallowing provides a release. Not unlike what happens with a person who turns to drugs or alcohol in distress, an insidious pattern develops. It is for this that Dr. Armando Favazza has described the behaviors associated with superficial/moderate self-injury as "morbid forms of self-help." Tracing the skin with a blade, holding flame to flesh, or, in Lauren's case, con-

suming something dangerous provides distraction from distress and relief from emotional discomfort. Yet this relief does not last. The distress returns, and without a lasting means of addressing the unease, Lauren and others like her continue to seek temporary reprieve in reenacting their rituals of self-harm.

If the feedback loop takes hold, Favazza explains, the harmful behaviors “become an overwhelming preoccupation and are repeated over and over again,” comprising what he has termed “the repetitive self-mutilation syndrome.” People with this syndrome may truly feel as though self-injury is an addiction, and in severe cases their pattern of turning to it in times of distress may last for decades. Even when it remits, it is typically not without consequence. Favazza describes the “normal course” of repetitive self-mutilation syndrome as “ten to fifteen years during which the self-mutilation is interspersed with periods of total quiescence [as well as periods of] impulsive behaviors such as eating disorders, alcohol and substance abuse, and kleptomania.”

For family members and clinicians who care for self-injurers, the act of self-harm is frequently incomprehensible and the impulsivity associated with it can be infuriating. The primary response evoked in caregivers is often one of anger and resentment. After I first saw Lauren, I went from the emergency room up to the hospital floor where she was to be admitted so that I could see the preparations taking place for her admission. Nurses and other staff members were busily removing medical equipment from the walls, taking away all loose objects, and covering over fix-

tures. I stood in the doorway. The only other times I had seen this many hospital employees in a patient room, a code had been called because someone was in cardiac arrest and needed resuscitation.

“Wow,” I said astutely.

A nurse walked by me, carrying parts of a metal IV pole. “Yeah, wow,” she said with a sarcastic snort. “As if I’m not busy enough, I gotta waste time pulling all this apart for our most frequent flier every time she decides she wants a little attention. It’s not like there are other patients of mine who are ... I don’t know, actually *sick* or something. God forbid I spend my time doing things for them ...”

I was not immune to Lauren’s maelstrom. Once she was admitted, I visited her room daily, attempting to engage her in any way I could. I tried to connect with her, at first naïvely and proudly, hoping I could penetrate her caustic exterior and, in doing so, truly steer her toward health. During one visit I tried to offer her a chance to talk about the experiences that had led to her behaviors; during the next I proposed that we discuss coping strategies she could utilize when she felt the urge to swallow something. Despite the lengthy list of medications she’d tried, I went through them one by one with her, struggling in vain to discern whether any one of them had been more helpful than another. Each time I saw her, I endeavored to cajole her into seeing the benefit she would reap from committing more fully to the outpatient treatment that she would have after she was discharged. Perhaps, I imagined, my empathetic ear could succeed where so many others had failed. This fantasy, of course, was fleet-

ing. Some days she ignored me. Others she tore into me in a fit of rage.

Lauren met each of our encounters with derision. Although I typically felt composed and in control during clinical meetings with patients, working with Lauren made me feel inept. I couldn’t even reasonably call it “working with Lauren.” I was floundering, and I was sure she could see it. No matter how steadily I attempted to keep my cool, I began to feel that Lauren could sniff out my discomfort. As a psychiatrist, I felt confident in my ability to make patients feel calm and safe in my presence. But Lauren’s turmoil wouldn’t steady. Rather than providing her with security, I felt as though I were absorbing her unease. And the more wobbly I felt, the more emboldened and unwavering her aggressive stance became. My savior fantasies vanished, and I began to dread my daily obligation to round on her. ...

The next day at the hospital, as I prepared for Lauren’s imminent discharge, I threw myself into creating an aftercare plan for her that would be more than a formality, one that actually had a chance of helping her break this cycle of admission after admission. Without insurance or money to self-pay for her treatment, Lauren did not have the option of seeing a private psychiatrist or psychotherapist. If she did, she might have been seen by a therapist every week for an hour and a psychiatrist once or twice a month. Instead Lauren was treated by an overextended, publicly funded mental-health center where she was scheduled to see a psychiatrist for twenty minutes, four times a year. Of course, in one of the ironies

that are all too common in a country with health-care discrepancies, a single hospital admission for Lauren—paid by the taxpayer-funded state medical-assistance program—cost more than a year of private outpatient care would.

I called the psychiatrist at the mental-health center to whom Lauren was assigned and learned from him that one of the center's only other psychiatrists had recently quit. With an ever-increasing caseload and an ever-shrinking budget, he said, there was no chance of her being seen more frequently. I had him transfer me to Lauren's case manager to inquire if she could at least be seen by him more regularly. Lauren didn't keep her appointments, the case manager told me. True, he said, she had no car and lived miles outside the bus route. "Look ..." He paused. "There's only so much I can do. I can't help her if she doesn't come in." I asked about the center's mobile treatment team that goes to patients' homes, takes them their medications, drives them to their appointments. "I guess it's possible," the case manager said. "She'd have to be evaluated by them. Let me check the book." I waited on hold for several minutes. I was eventually disconnected. I called back. "Oh, hey," the case manager said. "Yeah, I can book her for an appointment for a mobile treatment team eval. Our first available opening is June twenty-third." It was now February.

I headed to Lauren's room. She had been fully cleared by the medical team, and they were awaiting our confirmation that she was safe to leave the hospital. I had her outpatient-care plan in my hands, and it included Lauren's appointment to be seen by the mobile treatment

team, though a long four months from now. And much of the plan had a chance only if she diligently followed it and if the realities of her poverty and her limited sources of emotional support didn't intrude, as they would, as they always had. I knocked on her door, and as I stood waiting for her to respond, I still felt I had done almost nothing for this patient. ...

As I entered, I thought of something a beloved supervisor said to me during my training, about working with difficult patients. "Sometimes holding all the blackness they feel is the only thing you can do. That's not nothing. And sometimes it is enough."

"Hey," I said. "I understand they're ready to let you go. How do you feel about that?"

"Oh, Jesus, with the 'How do you feel?' shit again," she moaned, although this time there was a current of nervousness beneath her tone. "I hate this place! I've been ranting to get out of here for days."

I handed her the number I had for her case manager. "So, Lauren," I began, "if you can bring yourself to do it, next time you're upset and you feel the urge to swallow something, you might try calling first."

"Why would I do a stupid thing like that?" she asked.

"Well," I said, "maybe they could help."

She scoffed.

"And more than anything, Lauren, I'm afraid that one of these times you're going to swallow something and it's not going to go this way. I mean, I'm afraid you could swallow something and then you could die."

She rolled her eyes. "Like that'd be so bad."

"I think it would be," I said softly. "I think it would be terrible." She looked up at me, and for a minute I thought maybe she heard me.

"Yeah, well," Lauren said, "you'd be the only one."

I held out my hand to her to shake, and she took it. "Take care of yourself," I said.

To which she responded, "When can I get my stuff and get out of here?"

That evening I wrote in my consult note that I believed Lauren was safe for discharge. I didn't feel the relief I thought I would at her impending departure. I felt mostly sad. Not because I would be sorry to have her off my service but because I felt that the treatment she'd received this time—like so many other times in the past and surely more to come—was such a gesture, a Band-Aid on a gaping wound.

I headed down the hospital staircase to gather my coat and bag from the psychiatry office. I checked my pager one last time, and when I raised my eyes from its numbered screen, they fixed on the stairwell's wall ahead of me: the poster, the horses. *Whose woods these are I think I know. / His house is in the village, though; / He will not see me stopping here / To watch his woods fill up with snow.* ❧



Christine Montross is an assistant professor of psychiatry and human behavior and codirector of the Medical Humanities and Bioethics Scholarly

Concentration at Alpert Medical School. She is also a practicing inpatient psychiatrist and author of *Body of Work*.

ALUMNI ALBUM

CHECKING IN WITH BROWN MEDICAL ALUMNI

CLASSNOTES

ALUMNI

MMS 1970

Allen R. Dyer, MD, PhD '67 published *One More Mountain to Climb: What My Illness Taught Me About Health* (Lambert Academic Publishing, 2013), which chronicles his battle with multiple myeloma and his bone marrow transplant in 1998. Allen, a professor of psychiatry and behavioral sciences at the George Washington University School of Medicine and Health Sciences, will donate proceeds from the book's sale to The Willowcliff Foundation, which supports projects related to global health.

MMS 1971

Naomi Das Neufeld Flagg, MD '69 RES'75, P'99, '03 married Dennis Flagg on October 6, 2012; guests included

WHAT'S UP?

Career news, weddings, births—your classmates want to know.

Go to med.brown.edu/alumni and click on “**Updates and Class Notes.**”

CLASS ACT: Eve Hoffman '09 MD'13 gets a hug from honorary degree recipient Ben Affleck while accepting her class's symbolic degree at the University ceremony.



ADAM MASTOON

Anne Munder Bercovitch, MD '69, P'00MD'04, '02, '10. Naomi practices pediatric endocrinology in Los Angeles. She recently founded the Children's Wellness Institute, an Internet-based weight management program for kids, and contracts with hospitals and insurance companies. She has published two books: *KidShape: A Practical Prescription for Raising Healthy, Fit Kids* (2003) and *KidShape Café: Over 150 Kid-Tested Recipes* (2004). She spoke about child obesity at Reunion 2011.

1979

Daniel Harrop '76 RES'83 is running as a Republican for mayor of Providence. He made previous bids for the seat in 2006 and 2010. Dan, a psychiatrist in private practice in Providence, is a member of the Brown Medical Alumni Association Board of Directors, a member of the Committee for Continuing Medical Education of the Rhode Island Medical Society, and a consultant to several medical management companies. The mayoral election will be held in 2014.

1982

Lisa J. Goldstein '78 received the 2013 Charles C.J. Carpenter, MD, Outstanding Physician of the Year Award at The Miriam Hospital's annual medical staff association meeting in June. Lisa began volunteering at the hospital at age 12, and worked there throughout college and medical school. She joined the staff as a pathologist in 1990 and is also a clinical assistant professor of pathology and laboratory medicine at Alpert Medical School, where she has won more than a dozen teaching awards. She chairs the hospital's Credentials Committee and serves on the School's Undergraduate Medical Education Teaching Committee; is a member of the American Medical Association and Rhode Island Society of Pathologists; and is a fellow of the College of American Pathologists and American



WHO, ME? Elizabeth Silbermann '08 MD'13 waves to admirers during the Commencement march.



HAIL TO THE CHIEF: The Commencement chief marshal Sharon Wolfsohn Karp '80 MD'83, right, with her friend Charles R. Effron '80 MD'83, P'16.

Society for Clinical Pathology. Lisa also serves on the BMAA Board of Directors.

1986

Hon Lee '82 and **Emmie Fa** '86 MD'89 are proud to welcome the next genera-

tion of PLME participation in their family by their son, Blaze Lee '17 MD'21, who matriculated at Brown this fall.

Michael H. Lev '82 was inducted as a fellow in the American College of Radiology at the ACR Annual Meeting and

ALUMNIALBUM

Chapter Leadership conference in May. Michael is a diagnostic radiologist at Massachusetts General Hospital and Harvard Medical School. He is also a member of the Radiological Society of North America, the American Society of Neuroradiology, and the American Roentgen Ray Society, and he is a fellow of the American Heart Association.

Robert Panton '83 MMSc'86 became president of the Chicago Medical Society in June. A fellow of the American Academy of Ophthalmology and the

American College of Surgeons, he owns Panton Eye Center in Elmwood Park, IL, with his family, including his brother **Peter Panton** '79 MD'82, PMD'15.

Proud hockey dad **Manuel Rose** traveled with his sons' team to Sarnia, Ontario, last January for the International Silver Stick tournament, in which more than 60 US and Canadian teams competed. Son Spencer plays goalie for the Tampa Bay Scorpions' Midget squad, for 9- and 10-year-olds, who won the Southeast regional championship. Manny, a diag-

nostic radiologist and medical director and founder of Rose Radiology Centers, is the team radiologist for the NHL's Tampa Bay Lightning.

1990

Laura Cheever '86 was named associate administrator of the Health Resources and Services Administration's HIV/AIDS Bureau in the US Department of Health and Human Services. In her previous post as deputy associate administrator, Laura led the Ryan White HIV/AIDS Program and HRSA's programming for the President's Emergency Plan for AIDS Relief and helped develop federal guidelines for HIV care. She volunteers weekly at the Moore Clinic for HIV Care at The Johns Hopkins Hospital.

Manny Rose MD'86 is the team radiologist for the Tampa Bay Lightning.



FIELD DAY



BUNDLE UP: Rain and chill didn't keep alumni away from field day fun. **Selim Suner** '86 ScM'87 MD'92 RES'96, left, relaxes under the Medical School tent. Above, **Teddy Pan** '92 MD'96 and **Natalie Hsu** '94 MD'98 with children **Sydney** and **Michael**.

RICK FARRELL (2)

1991

Vik Siberry, son of **Uma Reddy**, MPH '88 and George Siberry, MD, MPH '88, is a member of the Class of 2017.

1995

Atul Butte '91 MMS'95 was honored at a White House ceremony June 20 as a Champion of Change, "for promoting and using open scientific data and publications to accelerate progress and improve our world." Atul, a pediatrician, geneticist, computer scientist, and entrepreneur at Stanford University, builds and uses computational tools that convert molecular, clinical, and epidemiological data into diagnostics, therapeutics, and new insights into disease.

1996

Alexander Chen '90 is a child psychiatrist and the medical director of the San Francisco Department of Public Health's Chinatown Child Development Center. He also trains second-year child psychiatry fellows of the University of California, San Francisco, in his clinic. Alex has worked for the city and county of San Francisco for 11 years and has been the medical director of three clinics. A class note in the spring 2013 issue of *Brown Medicine* incorrectly stated his specialty.

1997

Srihari S. Naidu '93 was elected by the Corporation of Brown University to serve a six-year term on the University Board of Trustees. An associate professor at SUNY-Stony Brook School of Medicine, Hari runs the Cardiac Catheterization Laboratory and Hypertrophic Cardiomyopathy Treatment Center at Winthrop University Hospital in Mineola, NY, and



POWER FAMILY: Alumni Early Achiever Leslie Gordon, right, celebrates with her husband, Scott Berns, MD, left, and their son, Sam.

Early Achiever

The **Brown Medical Alumni Association** presented the inaugural Early Achievement Award to Leslie B. Gordon ScM'91 MD'98 PhD'98. The award recognizes an alum who graduated within the past 15 years for outstanding service to the Medical School, their local community, or a scientific or academic achievement. After Leslie's son, Sam, was diagnosed with the early-aging disease progeria, she devoted her career to advancing understanding of and developing treatments for the disease. She is co-founder and medical director of The Progeria Research Foundation. Her work led to the isolation of the progeria gene, and she was co-chair of the first-ever clinical drug trial for the treatment of the syndrome. Last year, her combination therapy proved effective, with every child in the study showing improvement. A documentary about

The documentary *Life According to Sam* will air October 21 on HBO.

Leslie's work, *Life According to Sam*, debuted at the Sundance Film Festival earlier this year and will air on HBO on October 21.

BMAA Board member (and Leslie's dear friend) Lisa Taitsman '90 MD'94 presented the award at Reunion Weekend's Opening Celebration. Knowing her friend would choose to share the spotlight with those who had helped her along the way, Lisa asked that Leslie take a moment to see herself as the rest of the world sees her: "An incredible, humble, passionate, and unstoppable woman who has moved a field ahead more in a decade than would be expected in a half a century at best."

ALUMNIALBUM



TOGETHER AGAIN: From left, Nick Sadovnikoff MD'84; his wife, Marcie Rubin, MD; and Lisa Keamy '79 MD'84, P'16.



ON THE TOWN: Bradley DeNardo MD'08 RES' enjoys a break from the wards.

is editing a textbook on hypertrophic cardiomyopathy. He is the president of the Brown Medical Alumni Association Board of Directors.

1998

Myechia Minter-Jordan '94 is president and chief executive officer of The Dimock Center, a health center in

Roxbury, MA. She was promoted in July from chief medical officer, a position she had held since 2007. Myechia, who completed her residency and her MBA at Johns Hopkins, was previously an attending physician and instructor at Johns Hopkins Medical Center and then director of medical consultation services at Johns Hopkins Bayview Medical Center. She lives in West Roxbury with

her husband, Larry, and their two young daughters.

2002

Smith "Jim" Apisarnthanarax '98 practices radiation oncology at Seattle Cancer Care Alliance Proton Therapy, where he specializes in treating gastrointestinal cancers. He is also an associate professor at the University of Washington School of Medicine. Jim was previously the associate residency program director and assistant professor of radiation oncology at the Perelman School of Medicine at the University of Pennsylvania, where he was recognized as Educator of the Year by the Association of Residents in Radiation Oncology. Jim completed his residency in radiation oncology at the University of North Carolina School of Medicine and a research fellowship in experimental radiation oncology at MD Anderson Cancer Center.

2004

John Kawaoka '00 RES'08 and **Cristina Pacheco** '00 RES'07 announce the birth of Daniel Noah on January 11. He joins big sister Madeleine.

2005

Paul George '01 RES'08 received the 2013 Rufus A. Lyman Award, which recognizes the best paper published in the *American Journal of Pharmaceutical Education* in the previous year. Paul, an assistant professor of family medicine and associate director of preclinical curriculum at Alpert Medical School; Richard Dollase, EdD, director of the Office of Medical Education at the Medical School; and three University of Rhode Island College of Pharmacy researchers developed a workshop for

medical, pharmacy, and nursing students to learn how to work together to solve patient cases. Their paper, "An Introductory Interprofessional Exercise for Healthcare Students," was published in October 2012.

2006

Christopher Jue '02 RES'09 joined Digestive Health Specialists, a colon cancer prevention center and independent gastroenterology practice in Winston-Salem, NC. Board certified in internal medicine and gastroenterology and a member of several medical associations, he completed his fellowship at Albert Einstein College of Medicine.

2007

Lauren Geller '03 married Henry Parkin '03 on May 27, 2012, in Westchester, NY. Attendees included **Cameron McClure** '03 and his wife, Zoe Hunton '03. Lauren is a fellow in pediatric dermatology at Columbia University Medical Center.

2012

Riabianca Garcia '05 married Stephen Telesmanic '02 in Boracay, Philippines, on February 16 after serendipitously kindling a romance after six years apart. Guests included **Thao-Ly Phan** '05 MD'09.

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STATE OF EXCELLENCE

Top Docs

Rhode Island Monthly's annual Top Doctors list often reads like a "who's who" of Brown University alumni and faculty. Just a handful of the 160 physicians, who are selected as the best in the state by their peers, in the magazine's May 2013 issue had no ties to Brown or Alpert Medical School. You can see the complete list, as well as a feature on Leslie Gordon ScM'91 MD'98 PhD'98 (see page 45), at rimonthly.com.

MD alumni and residents named tops in their field:

Peter Baziotis MD'90 (anesthesiology, pain management)

M. David Beitle, MD RES'98 (gynecology/obstetrics)

David Barrall MD'81 RES'86 (plastic/reconstructive surgery)

Anthony Caldamone '72 MMS'75 MD'75 (urology)

Gerardo Carino MD'99 PhD'99 (critical care)

Deus Cielo MD'96 (neurosurgery)

David Cloutier, MD RES'03 (general surgery)

Marlene Cutitar '83 MD'86 RES'92 (breast surgery)

Walter Donat MD'77 (pulmonary diseases)

Candace Dyer MD'80 RES'85 (breast surgery)

Maria Guglielmo MD'92 (neurosurgery)

Colin Harrington, MD RES'96 (psychiatry)

Howard Hirsch '82 MD'86 (orthopedic surgery)

Michael Hulstyn MD'86 (sports medicine)

Lynn Iler MD'95 (dermatology)

Razib Khaund, MD RES'92 (sports medicine)

Thomas Lanna MD'92 (cardiology)

Rashmi Licht '98 MD'02 RES'07 (urology)

Louis Mariorenzi '77 MD'80 (orthopedic surgery)

Michael Migliori '79 MD'82 (ophthalmology)

Thomas Miner MD'91 (surgical oncology)

Edward Pensa, MD RES'04 (gastroenterology)

Anthony Ricci MD'84 (allergy/immunology)

Steven Schechter, MD RES'91 (colon/rectal surgery)

Jeffrey Slaiby, MD RES'94 (vascular surgery)

King To '83 MMS'86 MD'86 (ophthalmology)

Andrew Triebwasser, MD RES'86 (anesthesiology)

Scott Friedman '82 MD'85 (radiation oncology)

Gwenn Vittimberga MD'85 (dermatology)

Matthew Vrees MD'97 (colon/rectal surgery)

ALUMNIALBUM

Jason Rothschild '07. See **Ana Lourenco** RES'07.

2013

Thomas J. Anderson married Alison M. Zangari on June 8, 2013, at Tanglewood in Lenox, MA. The couple met in 2010 while performing with the Tanglewood Festival Chorus, of which they are members. Tom, a bass baritone who also sings with the Boston Pops, will complete his medicine prelim this year at Roger Williams Medical Center in Providence before moving to Boston for his radiology residency at Beth Israel Deaconess Medical Center.

Zachary Drapkin '08 and **Zoe Raleigh '08** were married April 13, 2013, at Gin-

dling Hilltop Camp in Malibu, CA. Zak, a native of Malibu, and Zoe, of nearby Newbury Park, first met as freshmen at Brown; they've been together ever since. They began their residencies this summer at University of Utah Affiliated Hospitals in Salt Lake City, Zak in emergency medicine and Zoe in pediatrics.

RESIDENTS

1998

Maureen G. Phipps, MD, MPH, is the new chair of the Department of Obstetrics and Gynecology and assistant dean for teaching and research on women's health at Alpert Medical School. She was also named chief of ob/gyn at Women & Infants Hospital of Rhode Island

and executive chief of ob/gyn at Care New England. In addition to holding the Chace-Joukowsky Professorship in Obstetrics and Gynecology, Maureen is a professor of epidemiology in the School of Public Health.

2007

Ana Lourenco, MD, was lead author and researcher of a new study that found that academic medical centers have higher rates of recall following mammography than community radiology centers. The paper, "Screening Mammography Recall Rate: Does Practice Site Matter?", coauthored with **Jason Rothschild '07** MD'12 and Martha Mainiero, MD, was published in the journal *Radiology*. Ana is a radiologist at

Tom Anderson MD'13 and his wife met while performing at Tanglewood.

OPENING CELEBRATION



ALL SMILES: Shoma Dhar '99 MD'04 gets ready to party.



LEAN IN: Above, from left, John Cangemi '75 MD'78, P'06, Judy Gibbs Shaw MD'78, and Paul Broomfield '75 MD'78. Below, Sabatino Giordano, left, and Will Perez '08 MD'13.



ADAM MASTOON (3)

Rhode Island Hospital and assistant professor of diagnostic imaging at Alpert Medical School. Jason is a radiology resident at UC Irvine Medical Center.

2008

Jennifer Turner Gartman, MD, joined Blackstone Valley Family Physicians in Whitinsville, MA. Jennifer, who is board certified by the American Board of Internal Medicine and Pediatrics, received her medical degree from Georgetown University School of Medicine and completed her residency training at Rhode Island Hospital and Hasbro Children's Hospital. Previously, she was an attending physician and medical director of the Medicine-Pediatrics Primary Care Center in Providence. She also was a physician at the Rhode Island Training School juvenile detention center and an assistant professor of pediatrics at Alpert Medical School.

2009

Jeff Manning, MD, and **Jordan White, MD, MPH**, welcomed Liza Catherine into their family on May 30. Jeff is the medical director of Sports Medicine Associates in Danielson, CT, and a physician at the University of Rhode Island Health Services. He's also a clinical instructor of sports and family medicine at Alpert Medical School and UMass Medical School. Jordan, a staff physician at Memorial Hospital, is a clinical assistant professor of family medicine at Brown. She earned her MPH at the UMass School of Public Health.

FELLOWS

2013

Gabriel Delgado, MD, joined the Bradenton Cardiology Center in Bradenton,




THE NEWEST ALUMNI: Above, Mason Hedberg '08 MD'13 at Commencement. Below, from left, Christian Brown MD'13, Saul Rivard '08 MD'13, Ravi D'Cruz MD'13, and Preston Linson Gentry '08 MD'13 line up before the ceremony.



Maureen Phipps, MD RES'98 is the new chair of ob/gyn at Alpert Medical School.

FL, in July. A specialist in interventional cardiology, Gabe's fellowships included general and interventional cardiology as well as advanced vascular and endovascular medicine, and he served as chief cardiology fellow at Rhode Island Hospital.

Jason Frost, DO, joined the pulmonary and critical care team at Mercy Hospital in Portland, ME. During his critical care fellowship, Jason traveled to the University of Tübingen in Germany to teach a critical care course to medical students attending the International Winter School. 

OBITUARIES

ALUMNI

FAIZA FAWAZ ESTRUP, PHD MD'75

Faiza Fawaz Estrup, 80, of Santa Barbara, CA, died July 21, 2013. A clinical professor emerita of medicine at Alpert Medical School, she was a member of the School's first graduating class and in 1999 was appointed the first associate dean of medicine for clinical faculty.



Faiza Fawaz Estrup

A native of Lebanon, Faiza came to the US at age 18 to study physics at Boston University. She then received a Higgins Scholarship and completed her doctorate in biophysics at Yale. She helped set up the first research biophysics lab at Bell Labs in New Jersey and taught chemistry and molecular biology at Haverford College before matriculating in Brown's Program in Medicine in 1972. Following residency training and a fellowship, Faiza was a practicing rheumatologist and medical director of the Arthritis Center of Rhode Island. She served as chief of rheumatology at Memorial Hospital of Rhode Island for 20 years.

A fellow of the American College of Physicians and a founding fellow of the American College of Rheumatology, in 2002 Faiza was voted the Rhode Island

Woman Physician of the Year by the board of the Rhode Island Medical Women's Association and received the Brown Medical School Excellence in Teaching Award. The Consumers' Research Council of America selected her as one of America's Top Physicians for the years 2003 to 2007.

In 2004, Faiza and her husband, Peder J. Estrup, PhD—Newport Rogers Professor of Chemistry, professor of physics, and dean of the Graduate School and research emeritus—retired in Santa Barbara, which reminded her of Lebanon. She became a member of the Los Padres Watercolor Society and studied Spanish at Santa Barbara City College, and they traveled extensively in Europe, Asia, the Middle East, Australia, and New Zealand. She was a true Renaissance woman.

Faiza leaves her loving husband of 56 years and extended family in Lebanon, Denmark, and Austria as well as the US. Gifts to a term scholarship in Faiza's honor can be sent to Brown University, Office of Biomedical Advancement, Box G-ADV, Providence, RI 02912.

RICHARD L. SMITH '73 MD'76

Richard L. Smith, 62, of South Hamilton, MA, died June 8, 2013. After completing medical school, Rick—also known as Bucky to his family and friends—served in the US Public Health Service in Providence and Cambridge, MA. He dedicated the remainder of his career to his private family medical practice in Rowley, MA, as well as the Hogan Regional Center in Danvers, MA, and Beverly Hospital. Rick loved the arts, hiking, scuba diving, the Boston Celtics, and the Rolling Stones, and could often be found at 40 Steps Beach in Nahant, where he grew up. Those who knew him thought of him as a “*mensh*,” a very good person. He is survived by three sons, Rich-

ard, Marc, and Nicholas; two sisters and two brothers; and 16 nieces and nephews.

JANUSZ E. STARAKIEWICZ, MD RES'02

Janusz E. Starakiewicz, 50, of Warwick, RI, died April 6, 2013. A pathologist and the medical director of the blood bank at Memorial Hospital of Rhode Island, he was an assistant professor of pathology and laboratory medicine (clinical) and taught in Alpert Medical School's pathology residency program. Janusz, who was born in Poland, received his medical degree from Jagiellonian University in Krakow, Poland, and served his residency at Brown. He had lived in Warwick for 15 years. He was a member of the American Medical Association, United States & Canadian Academy of Pathology, and the College of American Pathologists. Janusz was the beloved husband of Maria Starakiewicz, MD, a pediatrician in Cumberland, RI. He is also survived by his sons, Piotr and Pawel; and a sister and brother.

FACULTY

SIEGFRIED M. PUESCHEL, MD, PHD, JD, MPH



Siegfried Pueschel

Siegfried Pueschel, 82, of East Greenwich, RI, died September 2, 2013. Globally recognized as a leading Down syndrome researcher, the professor emeritus of pediatrics directed the Child Development Center at Rhode Island Hospital for nearly four decades. A member of the Professional Advisory Council of the National Down Syndrome Congress, he spoke around the world for the organization. He studied developmental disabilities and inborn errors of metabolism as well as Down syndrome, and authored or coauthored 15 books and more than 240 scientific articles. A lifelong learner, he earned his MD at the Medical Academy of Düsseldorf in 1960, his MPH from the Harvard School of Public Health in 1967, his PhD in developmental psychology from the University of Rhode Island in 1985, and his law degree from the Southern New England School of Law in 1996. He retired from Brown and Rhode Island Hospital in January 2013. Siegfried was predeceased by his wife, Eny; his daughter Pamela H. Callaghan-Nau; and his son Christian, who had Down syndrome and was an inspiration to his father throughout his 33 years. Siegfried is survived by his son Siegfried R. Pueschel, his daughter Jeanette Larson, and five grandchildren. Donations in his memory may be made to the Down Syndrome Society of Rhode Island.

JACOB CANICK, PHD

Jacob Canick, 68, of Newton, MA, died May 19, 2013. A professor of pathology and laboratory medicine at Alpert Medical School, Jack discovered a prenatal screening marker for Down syndrome that is now used routinely in prenatal practice worldwide. He earned his doctorate at the University of Rhode Island and completed postgraduate training at Harvard, coming to Women & Infants Hospital in 1982 to establish the

“He was very humble, very laid back. He was incredibly generous and kind.”



Jack Canick

Division of Medical Screening and Special Testing, of which he was director.


A world-renowned expert in prenatal screening, Jack recently led an international trial of a non-invasive diagnostic of fetal chromosome abnormalities, potentially revolutionizing prenatal care. He authored more than 200 research studies, review articles, and scientific abstracts, and lectured worldwide. Yet no one who met him—perhaps while hiking with his wife of 33 years, Marsha Rogers Canick, or at a Texas barbecue restaurant, relishing his favorite cuisine—would have guessed he was so accomplished, according to GERALYN LAMBERT-MESSERLIAN, PhD, associate professor of pathology and laboratory medicine and associate director of the medi-

cal screening division for 20 years. “He was very humble, very laid back,” she says. “He was incredibly generous and kind.”

That characteristic continued with his students, GERALYN adds. “He was very patient in his teaching,” she says. “He would always listen, and considered different opinions thoughtfully.” He excelled at fostering collaborative relationships and led large international, multi-center grants with ease and grace. “Many people refer to him as a true gentleman,” GERALYN says.

In addition to his beloved wife, Jack leaves two sons, Simon and Alex; a sister, Pearl Solomon; two daughters-in-law; and four grandchildren. Contributions in his memory may be made to the Conservatory Lab Charter School, 25 Arlington St., Brighton, MA 02135.

RAYMON S. RILEY, MD

Raymon S. Riley, 81, of Seekonk, MA, died July 12, 2013. For more than 40 years Ray practiced cardiology in Providence, and was a member of the medical staff at Rhode Island Hospital and a clinical professor emeritus of medicine at Alpert Medical School. After earning his medical degree at Tufts University School of Medicine, he served as a medical officer in the US Navy for three years. He was a fellow of the American College of Cardiology. Ray loved the many joyful family gatherings at his Seekonk home and their beach house in Narragansett, RI. He leaves his wife of 58 years, Elizabeth; their children, Linda, Kathleen, Marylouise, Susan, and Raymond; and six grandchildren. 

MOMENTUM



FOND FAREWELL: At left, Edward Wing, center, enjoys his going-away party with his family—from left, sons Ken and Jonathan, who is holding granddaughter Frannie, and his wife, Rena. Not pictured is Ken’s fiancée, Katie. Above, Nick Beckwith announces the new scholarships.

Fit for a Wing

New scholarships pay tribute to former dean.

What do you get a man who has everything? If he’s someone who devoted his life to medical education, such as Dean Edward J. Wing, MD, how about a medical student scholarship?

Dozens of friends, faculty, and staff contributed to a scholarship fund in honor of Wing stepping down from the deanship in June. In fact, the effort was so successful, two scholarships were established. One, a term scholarship, was awarded immediately to current students. The other, the Edward J. Wing, MD, Medical Scholarship, is an endowed fund that will provide financial aid to deserving students in perpetuity.

G. Nicholas Beckwith III ’67, PMD’99 RES’02, former Brown University vice chancellor Marie J. Langlois ’64, and Fred J. Schiffman, MD, P’96MD’00, Sigal Family Professor of Humanistic Medicine, led the effort to establish the scholarships.

Langlois harkened back to Wing’s

days as a football player in a video tribute. “He’s very competitive, but he’s a team player, and when he became dean, he brought to that position deep understanding of the tremendous challenges physicians in the community were facing,” she said. And that drive, she said, made it possible to move major projects such as the new medical school building forward.

Caitlin Cohen ’08 MD’15, who was mentored by Wing in the Medical School’s Doctoring course, noted his ability to switch between his multifaceted roles as dean, teacher, and community doctor. “One day before clinic he had to make a call regarding some

\$19-million donor, and then four minutes later he was taking off a homeless man’s socks to examine his feet.”

In all, six students benefited from the term scholarship. Three were on hand when the scholarship was announced at Wing’s farewell party in June.

Wing was deeply touched by the honor, quoting Lady Mary from *Downton Abbey* in his remarks, “We English don’t show our feelings on the outside, but that doesn’t mean we don’t have them.”

In all, more than \$250,000 was raised, giving the effort to increase

Six students benefited from the **Edward J. Wing, MD, Term Scholarship.**

scholarship support for medical students a major boost. With roughly 70 percent of students receiving institutional aid, more scholarships are needed to help students offset the burden of their educational loan debt.

—Kris Cambra  

“Mental health is often stigmatized and overlooked due to lack of funding in minority communities, and I was determined to think of a way to increase the utilization of these services that addressed stigma and cost.”

— Melissa M. Cranford '09 MD'14



A gift to the Brown Medical Annual Fund changes more than the lives of students . . .

. . . it allows them to change the lives of others.

Melissa believes culture and environment play an important role in how we experience health care. With support from the Brown Medical Annual Fund through the Scholarly Concentrations Program, she spent time at a psychiatric research NGO in India

to better understand how to implement low-cost mental health interventions in resource-poor settings. Now she is studying maternal depression among African American women and what role the community plays in their experiences.

Visit <http://bmaf.brown.edu> for more information. Give online at www.gifts.brown.edu.



BROWN
Alpert Medical School

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

Office of Biomedical Advancement • Box G-ADV • Providence, RI 02912 • <http://biomed.brown.edu/adv>