# BROWN MEDICINE

Volume 23 | Number 3 | Fall 2017

PLUS:



## BIG SHOT

**Jake Kurtis may have found the key to a malaria vaccine.**

# LETTER FROM THE DEAN

## Agents of Change

The stories in this issue of *Brown Medicine* illustrate clearly why we are working so hard to dramatically expand a translational science effort at Brown. Despite decades of study, people are suffering from diseases for which we have no reliable treatments, let alone cures.

Our new chair of the Department of Pathology and Laboratory Medicine, Jonathan "Jake" Kurtis, a triple alumnus and long-time faculty member, has spent years working on a potential malaria vaccine. His laboratory identified antibodies in a small population of children in Africa who were resistant to malaria despite frequent bites from infected mosquitoes. From these findings his team identified the antigens that the antibodies recognized and used this knowledge to develop a novel vaccine that could prevent people from dying from the illness. I think you'll find Jake's path to becoming a physician-scientist fascinating, and a very "Brown" story. He isn't driven by the glory of making a discovery but by alleviating suffering and death in the most impoverished nations.

Perhaps one of the most vexing problems we face in my field of pulmonology and critical care medicine is sepsis. Very little is known about its etiology and even less about how best to combat it. Although it is the leading killer of hospitalized patients, we are impressively lacking in our understanding of its pathogenesis and its optimal treatment. Here at Brown we have one of the world's leading experts on sepsis, Mitchell Levy. In this article, you'll meet Mitch and other clinicians and researchers who are conducting research and figuring out how to best treat this critical disorder.

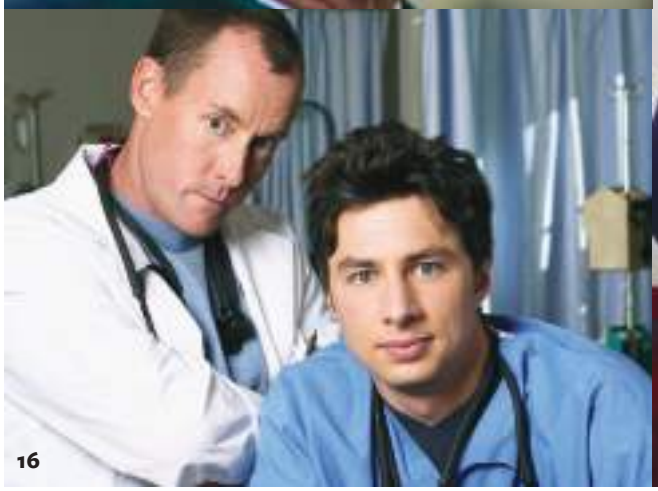
In addition to malaria and sepsis, there are many other disorders that lack effective therapies. They are complex problems that fall in the category of "unmet medical needs." We need to attack them with teams that include basic science researchers, master clinicians, computational biologists, physician-scientists, medicinal chemists, policy analysts, and other investigators if we are going to make needed progress. We're building those types of teams in the Brown Institute for Translational Science, where we are united in our mission to generate new knowledge and develop new therapies, diagnostics, and cures for the people who need them most.

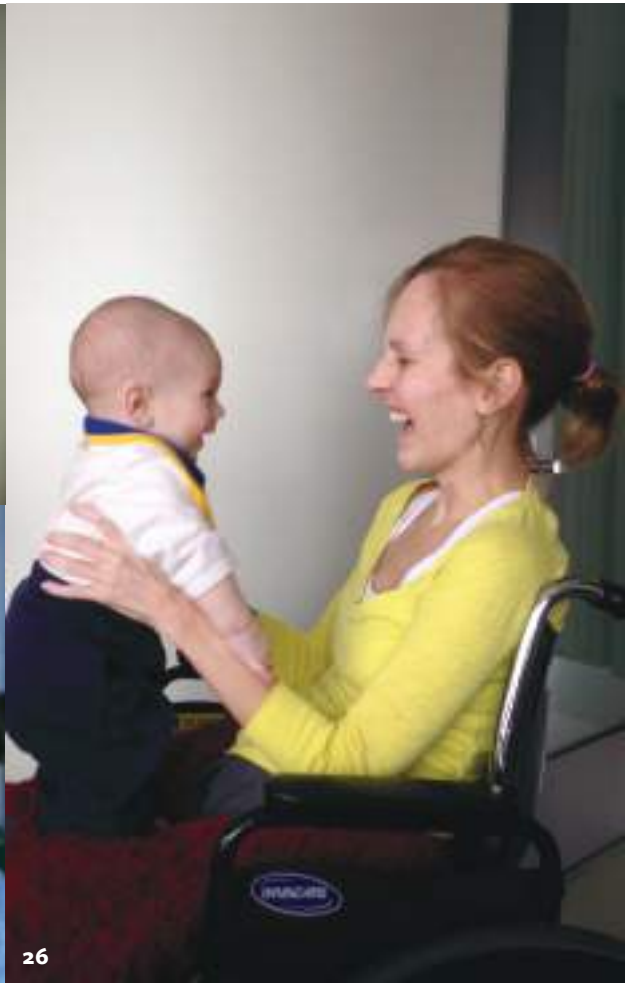
Sincerely,

Jack A Elias MD

***Jack A. Elias, MD***
Senior Vice President for Health Affairs
Dean of Medicine and Biological Sciences

SCOTT KINGSLEY


*"No one's immune from the ravages of sepsis."* ***—Mitchell Levy, Page 26***

# FEATURES



## DEPARTMENTS



## COVER

**Jake Kurtis, photographed by David DelPoio**

DAVID DELPOIO; COURTESY VICKY MORRONE; GETTY IMAGES

## LETTER FROM THE EDITOR

# In the Thick of It

## I'm writing this letter from my new office. It's half the size of the old one and has no windows, but I'm not bitter.

Seriously, I'm not. I'm not bitter because the reason we moved was that a research program was growing and needed more space, five new staff members were hired because of a multimillion-dollar grant, and 21 students were entering an academic program that's being housed in the old building. All good things, all of which came to fruition after years of hard work by faculty and staff.

From the new place, I can see the buses ferrying students from the University of Rhode Island and Rhode Island College to the nursing education center that just opened across from the Medical School building. Hundreds of Brown staff members will move in phases this fall to the same building, boosting the population (and, yes, the traffic) in the once-quiet Jewelry District. In the next two years two biotech incubators will open next door, promising high-paying jobs and advances in health care.

This cliché is overused, but so appropriate: if you build it, they will come. When we opened the Warren Alpert Medical School building in 2011, we said it would be a beacon that would bring new life to the area. After a few quiet years, we began to doubt whether it would play out as we envisioned. But finally, it's happening, and you can feel the excitement and positivity that come with educating the next generation of health care practitioners, giving people good jobs, and infusing the local businesses with traffic.

From where I'm sitting, that's not a bad place to be.

***Kris Cambra***

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Please send address updates to brown_medicine@brown.edu.

# INBOX

## DOCTOR'S NOTES

**Members of** the Warren Alpert Medical School community have been busy writing about their experiences. Links to these recent articles can be found at brownmedicinemagazine.org.

- **"Parking Lot Epiphany: My First Patient as a Physician"**
  Dominic Decker, MD, MS RES'19
  Internal Medicine
  *in-House*
- **"A Physician's Mission: Using Radio to Increase Health Literacy"** and **"A Condition of the Heart"**
  Anna Delamerced '16 MD'20
  *in-Training*
- **"I told my emergency medicine team to 'move on' after a horrific patient death. That was a mistake"** and **"I'm an ambassador to nightmares. My medical training didn't prepare me for that"**
  Jay Baruch, MD
  Associate Professor of Emergency Medicine
  *STAT*
- **"MICU Poem"**
  Cameron Gettel, MD RES'19
  Emergency Medicine
  *in-House*
- **"Mise en Place"**
  Carlos A. Rodriguez-Russo MD'19
  *JAMA Oncology*
- **"America Should Adapt New Zealand's Method of Handling Medical Malpractice Cases"**
  Vishal Khetpal MD'20
  *Slate*

## TELL US HOW YOU FEEL

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

- *Brown Medicine*
  Box G-P
  Providence, RI 02912
- Brown_Medicine@brown.edu
- Tweet us @BrownMedicine

PHOTO ILLUSTRATION BY PETER NASSOIT

## #REPRESENTATIONMATTERS

**Malika Favre's March *New Yorker* cover** was intended to show the last thing you see before you undergo surgery. But it touched off a social media phenomenon, resonating with women surgeons who so rarely see themselves reflected in depictions of surgery, or even medicine. Hundreds responded by tweeting their own #newyorkercoverchallenge photos, and in its first month the hashtag generated 145 million social media impressions.

While women make up only 9 percent of urologists in the US, 38 percent of the Warren Alpert Medical School's Division of Urology faculty are women. They got together with current residents to make their own version of the image, above. Clockwise from 12 o'clock, they are:

**Keara Decotiis**, MD RES'18; **Kathleen Hwang**, MD; **Danielle Velez**, MD RES'20; **Janice Santos**, MD; **Jennifer Fantasia**, MD RES'20; **Lauren Bakios**, MD RES'19; **Katherine Rotker**, MD F'17; **Simone Thavaseelan**, MD RES'10 F'11; **Madeline Cancian**, MD RES'18; **Liza Aguiar** '04 MD'08 RES'13. (Not pictured: **Rashmi Licht** '98 MD'02 RES'07.)

# THE BEAT

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



COMMUNITY

COLLEGE LIFE: Sarah Varela, left, got a jump start on her medical education with the help of mentor Samantha Paul '16 MD'20.

MARY MURPHY

# Path to Medicine

Med students mentor high schoolers interested in health care careers.

**Sarah Varela** has known since the seventh grade that she wanted to be a doctor. Specifically, a cardiothoracic surgeon.

"My aunt had a rare heart problem, and I got to meet the doctor who did the surgery," the 17-year-old says.

Varela is a senior at William M. Davies, Jr. Career and Technical High School in Lincoln, RI, and one of 50 local high school students who participated last year in the Pathways Mentorship Program at the Warren Alpert Medical School.

The program, which was started in 2013 by a group of medical students, connects high schoolers with mentors from the Medical School, the University of Rhode Island nursing and pharmacy schools, and the Bryant University physician assistant program. The program works primarily with students in underserved populations who have a significant interest in the health care field.

"We want to make sure we're reaching out to people we can make a difference with," says Samantha Paul '16 MD'20, Varela's mentor last year.

Pathways meets during the fall semester for monthly hands-on health care activities and one-on-one mentoring time.

The program concludes in January with a student research presentation.

"I liked being able to go inside the Medical School," Varela says. "My favorite part was the anatomy lab."

Because Varela did so well in the Pathways program, Paul knew she would be perfect for the Brown Pre-College Programs, specifically Summer@Brown, which offers courses for high school students on the University campus for one to four weeks.

> "It would be wonderful if this was the start of a long journey with Brown."

The Brown School of Professional Studies, which administers the portfolio of programs for middle and high school students, frequently partners with organizations that support students from low-income backgrounds, says Joi-Danelle Whitehead, associate director of Pre-College Programs and Diversity Initiatives.

A partnership between Pathways and the SPS Pre-College Programs was established to further support local students interested in pursuing careers in health care fields. Varela was one of six mentees from Pathways this year who received full scholarships to participate in Summer@Brown. Students could choose from any of the 50 courses related to medical and health studies. A few are taught at the Medical School, including "The Body: An Introduction to Human Anatomy and Physiology," "Hands-On Medicine: A Week in the Life of a Medical Student," and "Introduction to Medicine: Do You Want to Be a Doctor?", which is cotaught by Associate Dean of Medicine Julianne Ip '75 MD'78 RES'81, P'18 and Director of the Anatomy Course Dale Ritter, PhD.

The partnership between Pathways and the Pre-College Programs "aligns with the University's commitment to the local community and increasing access to students from historically underrepresented groups in higher education," Whitehead says.

It also supports academically talented students as they explore future careers in medical or health-related fields, says Abbey Aevazelis, associate director of Pre-College Programs and director of STEM Programs.

While participation in the Pathways and the Pre-College programs are no guarantee of future admission to Brown University, these experiences provide a unique opportunity for local students to experience personal growth and academic success at a selective institution, Aevazelis says. "It would be wonderful if this was the start of a long journey with Brown," she says.

Pathways mentors can help mentees decide whether to apply to medical school and guide them through the application process, mentor Kimberly Glerum '15 MD'20 says.

Varela is now looking into summer internships and exploring colleges. Of the Pathways program, she says, "It made me want to be a doctor even more."

***—Amy Anthony***

**Visit** *brown.edu/summer for more information about Brown Pre-College Programs.*

DAVID DELPOIO

**FACULTY**

# Best Practices

## Brown forges a stronger clinical alliance with the formation of BPI.

**With a few pen strokes,** an alliance years in the making was solidified during last May's Corporation meeting, when the presidents of six key faculty practices and Brown University formed Brown Physicians, Inc.

The new physician-led federation marks a major step toward achieving greater integration of patient care, research, and education across Rhode Island's health care sector. The foundations are The Neurology Foundation, Inc.; University Emergency Medicine Foundation; University Medicine Foundation; University Surgical Associates, Inc.; Brown Urology, Inc.; and Brown Dermatology, Inc.

**SIGNED, SEALED: William Cioffi, left, and Angela Caliendo.**

Together, the six foundations employ more than 500 doctors, all of whom are also members of the Warren Alpert

Medical School faculty, and many of whom work side by side in local hospitals with physicians and other health care providers at the hospitals.

"We believe that collaborating with our clinical partners to more tightly integrate patient care, research, and education will result in a significant and positive impact on the local community," University President Christina Paxson says.

Jack A. Elias, MD, senior vice president for health affairs and dean of medicine and biological sciences, and Kimberly A. Galligan, executive dean for administration in the Division of Biology and Medicine, joined the presidents of the foundations to form BPI's board of directors. Elias says the new organization will enable enhanced partnership between the foundations, Brown, and its affiliated hospitals as they seek to develop new therapies in laboratories and deliver the best medical care in clinical settings.

"I look forward to working with my colleagues to identify and implement a strategic approach that will help clinicians across important specialties identify efficient, effective ways to improve care for patients across the region," Elias says. "BPI will yield new opportunities for our Brown medical students, focus resources on urgent areas of innovative research, and enhance our ability to hire the best physician-scientists."

> "The creation of BPI underscores our commitment to the research and teaching missions of the Medical School."

Angela Caliendo, MD, PhD, vice president of University Medicine and BPI's interim executive director, says physicians will benefit too.

"Forming BPI is an important step, as it provides the foundations with the opportunity to enhance coordination of care, improve the quality of care for patients, better position us for success in the changing health care environment, and facilitate partnerships with the hospitals," says Caliendo, a professor of medicine. "The creation of BPI also underscores our commitment to the research and teaching missions of the Medical School."

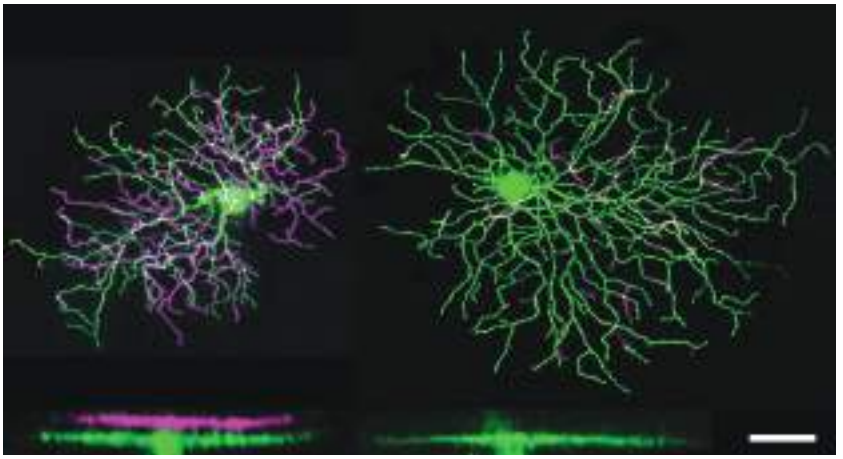
The partnership officially began July 1, and the board has been busy setting up the new organization's infrastructure.

In forming the partnership, both the physician practice foundations and the Warren Alpert Medical School will invest financially to ensure BPI's success in the short and long term. The University will contribute funds toward operations during BPI's first decade and raise funds to endow professorships and make new hires within the partnership. Meanwhile, the members of the foundations will contribute a modest percentage of revenues toward supporting research and other academic activities.

***—David Orenstein***

DAVID DELPOIO

**THE PRINCIPALS: From left, Lindsay Graham, formerly of Brown; Louis Rice, University Medicine; Abrar Qureshi, Brown Dermatology; Dean Jack Elias; Angela Caliendo, BPI interim executive director; Brian Zink, University Emergency Medicine; Karen Furie, Neurology Foundation; William Cioffi, University Surgical Associates; Mark Sigman, Brown Urology; and Kimberly Galligan, BioMed executive dean.**



COURTESY BERSON LAB

# The Eyes Have It

## Retinal cells go with the flow to assess the body's motion through space.

**Think of the way** that a long, flat highway seems to widen out around you from a single point on the horizon, while in the rear-view mirror everything narrows again to one point. Or when a spaceship in a movie accelerates to warp speed, the illusion is conveyed by the stars turning into streaks that zip radially outward off the screen.

That's how a study published in *Nature* in June says specialized retinal cells discern motion through the world—by sensing that same radiating flow.

The finding is part of a broader discovery, made in mouse retinas, that may help explain how mammals stabilize their vision and keep their balance as they move, says senior author David Berson, PhD '75, chair of Brown's Department of Neuroscience.

To sense how it's moving in space, the brain relies on the motion-sensing vestibular system in the ears, and vision—specifically, how the image of the world is moving across the retina. The brain integrates information from these two systems, or uses one if the other isn't available—in the dark, for example, or when motion is seen but not felt, as in an airplane at constant cruising speed.

"Good cameras have gizmos that stabilize images," says Berson, the Sidney A. Fox and Dorothea Doctors Fox Professor of Ophthalmology and Visual Science. "That's just what the retinal motion and vestibular systems do for our own eyes."

From observations of thousands of retinal neurons led by Berson and lead author Shai Sabbah, PhD, a postdoctoral fellow in Berson's lab, the research team found that direction-selective ganglion cells (DSGCs) are activated when they sense their particular component of the radial optical flow through a mouse's vision. Arranged in ensembles on the retina, they collectively recognize the radiating optical flow resulting from four distinct motions: the mouse advancing, retreating, rising, or falling.

The reports from each ensemble, as well as from those in the other eye, provide enough visual information to represent any sort of motion through space. Sensing rotation is crucial for image stabilization, Berson says, because that's how the eyes can stay locked on something even while the head is turning.

"One of the biggest mysteries that is revealed by our findings is that a motor system that will generate a rotation of the eye in service of image stabilization is ultimately driven by a class of retinal cells organized around the patterns of motion produced on the retina when the animal translates through space," Berson says. "We don't fully understand that yet."

Notably, mice differ from people in this context because their eyes are on the sides of their head. Berson acknowledges no one has yet confirmed that humans or other primate eyes have DSGCs, but he strongly suspects they do.

"The function of image stabilization works in us very much the same way that it works not only in mice, but also in frogs and turtles and birds and flies," he says. "This is a highly adaptive function that must have evolved early and has been retained. Despite all the ways animals move—swimming, flying, walking—image stabilization turns out to be very valuable." ***—D.O.***

> "Good cameras have gizmos that stabilize images. That's what the retinal motion and vestibular systems do for our eyes."


COOL TOOL

**USER FRIENDLY**
**The NaloxBox designers were inspired by the simplicity of fire extinguishers and AEDs.**

# Outside the Box

## A doctor-designer collaboration puts a lifesaving drug in the public's hands.

**No one remedy** can turn around a crisis as complex as the opioid overdose epidemic. But there's only one "resurrection drug."

"Literally, a person is on the brink of death, blue from lack of oxygen, and you give them naloxone, and they can wake up and talk to you," says Geoff Capraro, MD, MPH, assistant professor of emergency medicine.

Capraro, a University Emergency Medicine Foundation physician in the pediatric emergency department at Hasbro Children's Hospital, doesn't see too many overdoses on the job. But the lifesaving potential of naloxone, which restores normal breathing in someone who's overdosed on heroin or prescription painkillers, and its relative ease of use, got him thinking about how to get the medication into the hands of the lay public.

"Imagine how troubling it would be if you were a bystander who knew it was an overdose, who knew the number one thing you needed was naloxone, and you had to wait seven minutes for an ambulance to come to give it," Capraro says. "What a shameful situation for somebody to die."

Inspired by the utility and ubiquity of fire extinguishers and AED boxes, last year Capraro crossed town to the Rhode Island School of Design, where he ultimately connected with Claudia Rébola, PhD, then an associate professor in the Industrial Design department, who specializes in designing health technologies. "We really tried to design a product that … [is] approachable and friendly, that people don't feel intimidated in using it," she says. "We cannot put visual or physical barriers for people to be empowered to save lives."

Capraro and Rébola's finished product, the NaloxBox, is accessible and familiar. A white, wall-mounted cabinet sporting a red cross on its transparent, Velcro-latched cover, it houses four doses of naloxone, a CPR mask, gloves, and instructions. They've installed the boxes and provided training at social services agencies and community health organizations, with more public locations to come. "It's a statement from the business or the facility [that says] 'we're taking this epidemic of deaths seriously,'" Capraro says.

So far they've received two minigrants from the Rhode Island Department of Health to build 84 units; the drugs were donated by an overdose prevention program at The Miriam Hospital. With only enough money for materials, they roped in family members to help build the boxes by hand, at Rébola's house, this summer. But as inquiries have rolled in from across the country and Canada, Capraro and Rébola are seeking funds to scale up manufacture and distribution. They hope the Social Enterprise Greenhouse in Providence, which selected NaloxBox for its health and wellness accelerator this fall, will bolster that growth.

> "Let's try to save lives by providing the naloxone to people."

"This is one way in helping the epidemic, and there are many, many other ways to do it," Rébola says. "Our first priority is, let's try to save lives by providing the naloxone to people." ***—Phoebe Hall***

*www.naloxbox.org*

NICK DENTAMARO

# *Facts + Figures*

## The MD Class of 2021, by the numbers.

**Applicants: 8,612** **6,360** applicants considered*

**318**
APPLICATIONS TO PRIMARY CARE-POPULATION MEDICINE COMBINED MD-SCM PROGRAM

**24**
ADMITTED

**Total Matriculants: 144**

* BASED ON *US NEWS* CATEGORIES: DIFFERENCE IS NUMBER OF COMPLETED SECONDARY APPLICATIONS RECEIVED IN AMCAS ROUTE.

**63** MEN **81** WOMEN

**24** AVERAGE AGE (RANGE 21-35)

### REPRESENTING

**30** US STATES, PLUS WASHINGTON, DC

**16** COUNTRIES (BIRTH OR CITIZENSHIP)

**59** COLLEGES AND UNIVERSITIES

### ROUTES OF ADMISSION

- AMCAS (STANDARD ROUTE OF ADMISSION) ..... 92
- PROGRAM IN LIBERAL MEDICAL EDUCATION ..... 42
- POSTBACCALAUREATE ..... 8
- EARLY IDENTIFICATION PROGRAM ..... 2


JORDAN EMONT MD'20

## Are You New Here?

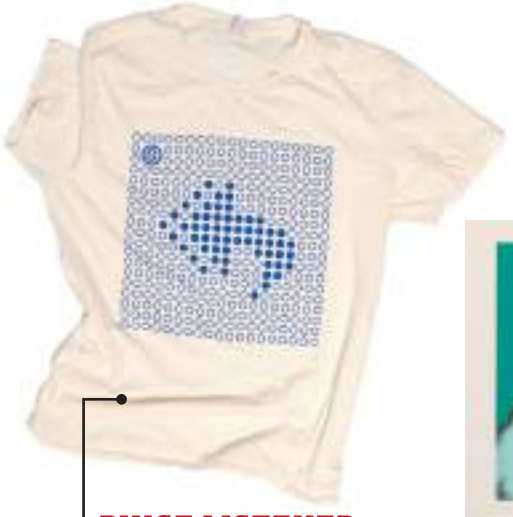
**Convocation kicked off the academic year on September 5 and Warren Alpert Medical School students joined the University community in marching through the Van Wickle Gates. Pictured are, left to right: Ronald Akiki MD'21, Andrew Del Re MD'21, Gisel Bello MD'21, Pranati Panuganti MD'21, Chibuikem Nwizu '17 MD'21, Gabriel Onor MD'21, Vivian Chan MD'21, and Wenzheng Yu MD'21.**

ANATOMY OF A DEAN

# The Future Is Female

**Katherine Sharkey, MD, PhD,** was a resident in Rush University Medical Center's combined medicine and psychiatry program when she had her two sons, Nick and Alex. No problem, she figured—she was already used to staying up all night. "I got my butt kicked," she recalls. "You're not on call every night. With a baby it's every night." But as a neuroscientist, the ordeal piqued her interest—she'd been studying sleep since her first job out of college, as a research assistant in Brown's Sleep for Science Research Lab—and she's worked at the intersection of circadian rhythms, mood, and women's health ever since. Now an associate professor of medicine and of psychiatry and human behavior, and the medical director of the University Medicine Sleep Center, Sharkey (whom everyone calls Katie) is studying whether light therapy for pregnant women will improve their mood and even lower their risk for postpartum depression. "When pregnant women complain that they're not sleeping well, people say one of two things: 'Well, of course, you're pregnant,' or 'Just wait, it's going to get worse'—neither of which are helpful," she says. "So that really gets ignored as a problem." Just as Sharkey advocates for women patients, she speaks up for her female colleagues, too, as the assistant dean for women in medicine and science. She says her office's professional development and educational programming helped her navigate a "challenging work environment for young women with young kids" when she arrived at Brown 10 years ago. Reflecting on the office's continued relevance, Sharkey says, "The fact that it exists acknowledges the fact that we're not done." She adds, "It would be great to not be needed. But ... there are a lot of people who don't believe that women can contribute." ***—P.H.***

ADAM MASTOON



**BINGE LISTENER**

**Listening to podcasts "is my favorite thing to do in the car," Sharkey says; she wears this shirt to show her love for *Reply All*. "I'm forever quoting [hosts] Alex and PJ."**

**THE ART OF SLEEP**

**This print from *Dr. Seuss's Sleep Book* hangs in Sharkey's bedroom. "I know I'm not the only sleep doc who has this picture," she says.**


**TRUE ORIGINAL**

**A native Rhode Islander, Sharkey has her grandpa's plate (John Sharkey, born 1917) on her minivan.**


**CARD-CARRYING READERS**

**The library is one of Sharkey's family's favorite local haunts, for book club selections as well as the latest movies.**

**A.I. STYLE**

**Sharkey doesn't like shopping, so she gets her work clothes from Stitch Fix. "I have to look professional," she says. "I'd rather be wearing that [*Reply All*] T-shirt."**


**IT'S IN THE BAGS**

**Everywhere she goes Sharkey has three bags in tow, including her locking suitcase (which her husband calls "the nuclear football"). But it contains clinical files and two laptops, not launch codes.**

**WHAT'S UP, DOCK?**

**Sharkey and her husband, Keith Callahan, MD, MBA, clinical associate professor of family medicine, couldn't resist some wordplay when they named their sailboat the *Paradox*.**

ADAM MASTOON (5)

**WHO KNEW?**

# Laugh It Off

## Comics provide relief from the intensity of the research lab.

**One of Brown** University's researchers is leading a double life.

OK, he's not a costumed crime fighter—but he does fight to bring a little levity to the science world with his biomedical-themed cartoons, *Biocomicals*.

"In the daytime I'm Dr. Uzun. At night I'm Mr. Uzun, the cartoonist," says Alper Uzun, PhD, assistant professor of pediatrics (research).

After wrapping up his work to identify the complex gene network responsible for preterm births and preeclampsia, Uzun breaks out his pen and paper. Each single-paned comic focuses on what he knows best: biomedical research. *Biocomicals* explores many facets of life in the lab, from the challenges of publishing academic papers to PhD defense jitters; a newer line of comics considers the perspective of the lab supplies themselves.

Uzun's passion for drawing reaches back to his childhood in Turkey. With an artist mother, his home had ample supplies for creative exploration. As a kid, Uzun would bring drawing materials on visits to family friends. He recalls being careful to adjust the amount of paper to how fun the friend's house was—less entertainment meant more paper.

"Other kids were bringing their toys. I was bringing drawing papers," he says.

Uzun also credits the great cartoonists of his native country for

stoking his drawing passion, including humorist Yigit Ozgur and the late political cartoonist Oguz Aral. Uzun focused on drawing comics because of the medium's inherent freedom to create exaggerated characters.

"In mediums like oil painting you represent things the way they actually are, but in cartooning you can do whatever you want. You can make big noses, or funny faces—there's no limit," he says.

While Uzun uses Adobe software to easily add color and publish his cartoons to www.biocomicals.com, which are freely available for educational use, he always keeps a little notebook and pen handy for when inspiration strikes.

In a new venture, Uzun and his wife, Ece Gamsiz Uzun,


> "In cartooning you can do whatever you want. You can make big noses or funny faces."

PhD, assistant professor of pathology and laboratory medicine, are gathering off-the-wall questions from their 4-year-old son, Kaan. Soon Uzun's cartoons will answer fundamental questions like "how are Legos made?" or probe into the nature of morality by asking, "If Princess Leia and Han Solo are both good characters, how can their son be a bad guy?"

For Uzun, whether he's cartooning a centrifuge tube's reaction to being contaminated, or a PhD student who just can't get off Facebook, he has one goal: "I try to encourage positivity and make life just a little more enjoyable."

***—Liz Droge-Young, PhD***

# 6 Things You Should Know

**1 STROKE RATES: DOWN FOR MEN, STEADY FOR WOMEN** In a study led by Tracy Madsen, MD RES'12 F'14 ScM'14, an assistant professor of emergency medicine, men showed considerable improvement in their stroke risk between 1993 and 2010, but women did not show a statistically significant drop. In the journal *Neurology*, Madsen and colleagues analyzed data on strokes occurring in a population of 1.3 million people age 20 or older living in a five-county area of southwest Ohio and northern Kentucky. For men, the rate dropped from 263 strokes per 100,000 to 192 per 100,000 over the study period. Among women, the rate decreased from 217 strokes per 100,000 to 198 per 100,000, which is not a statistically significant difference. However, Madsen says the data do not explain why men have shown such improvement while women have not.

**2 RISK FACTORS FOR HOSPITALIZATION** With the goal of prevention, a new study of children and teens with autism spectrum disorders found five risk factors that are significantly associated with an increased likelihood of seeking inpatient psychiatric care. The strongest predictor was the presence of a mood disorder, which was associated with a seven-fold increase in the odds of hospitalization. The presence of sleep problems was the second strongest risk, more than doubling the odds. A high score on a standardized scale of autism symptom severity raised the odds a little bit, though still significantly. Meanwhile, having a high score on a standardized scale of "adaptive functioning," or basic life and coping skills, lowered the odds of hospitalization. Finally, children and teens in households with married caregivers had only 0.4 times the odds of needing hospital care compared with comparable patients living with only one adult caregiver. The study, published in the *Journal of Autism and Developmental Disorders*, made use of two large datasets with unusually rich information about patients: the Autism Inpatient Collection, which includes data from children's psychiatric hospitals in six states, and the Rhode Island Consortium for Autism Research and Treatment, a coalition of local institutions that includes about 1,500 patients and their families.

**3 LOOK INTO MY EYES** Research is advancing the possibility that the retinas will help identify Alzheimer's disease risk long before symptoms begin. A study underway at Butler Hospital and Rhode Island Hospital has two goals: to see whether the drug solanezumab will prevent or delay memory loss and slow amyloid plaque buildup in people at increased risk for Alzheimer's; and to test whether a retinal scan can monitor that progress as well as more expensive PET scans. Patients stare into the same optical coherence tomography (OCT) scanner used to look for macular degeneration or glaucoma. The resulting images are inspected for the presence of amyloid plaques. If the retina can provide a reliable reflection of early but significant Alzheimer's disease risk in the brain, using OCT could increase the number of people who receive an early risk assessment and could save tremendous amounts of money. The best chance for treating Alzheimer's is to identify the disease long before symptoms arise, before too much damage may be done.

**4 FOLLOW-UP: BROKEN ELECTRONIC HEALTH RECORDS** A new study in the *Journal of Innovation in Health Informatics* reports widespread agreement among physicians that maintaining electronic health records (*Brown Medicine*, Spring 2017) undermines their connection with patients. The analysis found, however, that hospital-based physicians most often decried how EHRs take time away from patient contact, while office-based physicians were more likely to lament that EHRs detract from the quality of their patient interactions. Doctors reported trying to minimize the impact of EHRs by doing data entry at home. "What this speaks to is that we, as physicians, need to demand a rethinking of how quality is measured and if we're really getting the quality we hoped when we put in EHRs," says study co-author Rebekah Gardner, MD, an associate professor of medicine.

**5 HOW ILLUMINATING** With up to $9.2 million in funding over five years from the National Science Foundation, Brown University will lead a national center dedicated to developing and disseminating new tools based on giving nervous system cells the ability to make and respond to light. Neuroscientists could use the tools to uniquely manipulate and observe the circuitry of the brain in a variety of model organisms. The new "NeuroNex Technology Hub" is a collaboration of labs at Brown, Central Michigan University, and the Scintillon Institute. The team's charge is to invent, improve upon, and combine several unique bioengineering technologies to create new research capabilities. They will then make their advances rapidly, easily, and freely available to the global scientific community.

**6 ANTISENSE AND SENSIBILITY** A team led by Nikos Tapinos, MD, PhD, associate professor of neurosurgery, may have found a way to intervene in the process of healing peripheral nerve damage with the discovery in mice that an antisense RNA (asRNA) is expressed when nerves are injured. The asRNA, they wrote in *Cell Reports*, helps to regulate how damaged nerves rebuild their coating of myelin, which is crucial for making nerves efficient conductors. "It is possible that inhibiting or regulating the levels of the asRNA will enhance the transcription of myelin-related genes and hence myelination," Tapinos says. He hopes that his lab can translate the finding into a new therapy that could apply to nerve injury repair and peripheral demyelinating neuropathies.

## OVER HEARD

**"This is one of those classic cases of damned if you do, damned if you don't."**

*—Associate Professor of Medicine* **DAVID DOSA**, *MD, MPH, who says nursing home residents are more likely to get sick or die following hurricane evacuations,* Washington Post, *September 9*

INNOVATION

# Head Start

## Med students learn to prescribe medication-assisted therapy for opioid use disorder.

**In the first program** of its kind in the country, more than 30 members of the Class of 2018 at the Warren Alpert Medical School will receive training to prescribe FDA-approved medications for the treatment of opioid use disorders.

The Drug Abuse Treatment Act of 2000 (DATA 2000) requires physicians to obtain a waiver to prescribe the medications. With the training they receive at Brown, the medical students will be able to apply for the waiver once they graduate and receive their full medical license and Drug Enforcement Administration registration.

The state of Rhode Island and the Medical School created the program, outlined in a report in the *American Journal on Addictions* in April, to increase the number of DATA 2000-waivered physicians who could gain additional experience in treating substance use disorders during residency and provide access to clinical care. Training for the DATA 2000 waiver typically is not available to doctors until they are practicing. In future years, the program will extend to the entire Medical School class.

> "This program helps to bring treatment of substance use disorders into mainstream medicine."

"Not only does the DATA waiver program allow Alpert Medical School students to graduate having met the educational requirements for office-based treatment of opioid use disorder, but it also helps to bring treatment of substance use disorders into mainstream medicine and helps the students develop a greater sense of confidence in their ability to treat the disorder," says Elinore McCance-Katz, MD, PhD, professor of psychiatry and human behavior and co-creator of the DATA 2000 waiver program. (McCance-Katz is now the assistant secretary for mental health and substance use in the US Department of Health and Human Services, where she advises the HHS secretary on behavioral health care.)

The mechanism for DATA waiver qualification applies only to physicians practicing in Rhode Island, but the Rhode Island Department of Health will encourage other states to consider partnering with their medical schools to certify addiction medicine curricula that would qualify for a DATA waiver, too.

Training students in this way is important in addressing the opioid epidemic, says Paul George, MHPE '01 MD'05 RES'08, assistant dean for medical education and associate professor of family medicine.

"Hospitals and health care facilities are being overwhelmed by individuals who are seeking treatment for opioid use disorders, and they cannot meet the demand," he says. "This program is a significant step forward in increasing the number of physicians who can prescribe medications to treat opioid use disorders. My hope is that other medical schools will partner with their state governments to develop similar programs." ***—D.O.***


ISTOCK PHOTO

DAVID DELPOIO

## Reeling in the Years

**Friends, colleagues, and students (current and former) gathered on June 12 to celebrate Director of Medical Education Richard Dollase, EdD '62 as he retired after 20 years of working at Brown. In honor of his service, well-wishers contributed more than $17,000 to establish the Dick Dollase, EdD '62 Term Scholarship. The Brown Medical Alumni Association also presented him with their highest honor, the W.W. Keen Award, at Commencement in May.**

# ASK
## the Expert

## Can cutting the nicotine in cigarettes help people quit?

**When the US Food and Drug Administration announced in July a new policy to substantially reduce and limit the amount of nicotine in cigarettes, Jennifer Tidey, PhD, a professor of psychiatry and human behavior and of behavioral and social sciences (research), was in the spotlight. She co-authored an influential 2015 paper in the *New England Journal of Medicine* that found that, after just six weeks, people who received very low-nicotine cigarettes smoked fewer per day, were less dependent, and had minimal withdrawal discomfort compared to those who smoked normal-nicotine cigarettes. Tidey, an investigator in the Center for Alcohol and Addiction Studies in the School of Public Health, hopes this approach will help smokers with psychiatric disorders quit smoking.**

**People with psychiatric** and substance use disorder smoke almost half of the cigarettes consumed in the US. There has long been a belief that a major reason for the high prevalence of smoking in people with psychiatric disorders is that nicotine helps with psychiatric symptoms, by improving negative mood and anxiety, for example. If so, these smokers might experience worsening of symptoms when nicotine is reduced. However, when we compared responses to very low-nicotine cigarettes in people with higher and lower depressive symptoms, we found that those with higher depression reduced their smoking rates just as much as those with lower depression, and their depressive symptoms also improved.

Finding effective treatments for vulnerable populations is an important public health priority. We are continuing to study effects of this policy on people with psychiatric disorders and other vulnerable populations, and hope this policy will enable these individuals to achieve greater benefit from smoking treatments and other tobacco control policies. ***—D.O.***

ESSAY

BY GREGORY MOURADIAN '16 MD'20

# We're Only Human

## Knowing that even heroes have struggles is a comfort to med students.

**The Doctoring course** at the Warren Alpert Medical School pairs first- and second-year students with physicians in the community to practice a variety of physical exams and history-taking skills. In October 2016, I met my first-year mentor. He was a big-deal surgical attending and I was a deer in headlights. We decided the best way to schedule our "mentoring sessions" was through text message. He was cool that way.

For our second meeting, I met him at his office and he proceeded to take me to see patients. I began to sweat. But thanks to my new white coat, he couldn't tell. I had a new red notebook to take notes and a stethoscope just removed from its box. As we walked through the halls, I remained on his left and a step behind, following closely through the unfamiliar labyrinth.

There were many right turns from his office to the ICU. As he took the inside corner, I took the longer outer corner, forcing me occasionally to run to keep up. The backs of my stiff oxfords dug into my heels. His speed was extraordinary.

We passed through a set of double doors. BANG! My mentor's arms flew up as he simultaneously spun toward me, falling backward. The pens and papers in his long coat pocket went airborne with him. He ended up in my arms, eyes wide, looking up at me. For a moment, we remained motionless, stunned, staring at each other. He immediately jumped up. We composed ourselves and picked up the dropped papers. My mentor, now bright red, said "thank you" as he cleared his throat. And as though nothing had happened, we pressed on through the halls. But, I noticed, from the corner of his mouth, a new smile.

There is a slit behind the bottom-side pocket on most white coats. The long handle that opened the double doors got caught on this slit—a fulcrum that turned my mentor's exceedingly brisk velocity vertical.

This harrowing story serves as a warning for speeding doctors and health care workers alike. But it's also a teaching moment that humanized this attending for his first-year mentee. As students, it's hard to imagine our lives as attendings in a decade or more. It's hard to imagine synthesizing all the information we have yet to learn. It's comforting and reassuring to see our mentors, our heroes, struggle with a diagnosis.

There is no sudden moment when all our studying turns us into perfect doctors. Medicine is a difficult ebb and flow of constant learning, practicing, and improving. Please do not be afraid to show us your process.

**Gregory Mouradian** *was an economics concentrator in the Program in Liberal Medical Education. He is from Franklin, MA.*

PHOTO BY CHRIS HASTON/NBC/NBCU PHOTO BANK VIA GETTY IMAGES

BY REBECCA E. MACDONELL-YILMAZ, MD, MPH RES'15 F'17

# Kindred Spirits

## Chaplains and palliative care doctors share the power to ease suffering.

ISTOCK PHOTO

**As a palliative care doctor,** I often feel misunderstood. Though it's early in my training, I have already been called "Doctor Death" and heard doctors and nurses say over and over about patients in ill and failing health that "it's not time for palliative care yet."

It turns out that many of the people I encounter—patients and health care providers alike—have only a limited idea of what I do and, more importantly, the ways that I can help patients. They often assume that my role begins only when a patient is nearing death. But while palliative care does include hospice, in reality it is so much more.

Palliative care has all of the comprehensive, compassionate aspects of hospice care—expert pain management, spiritual and emotional support, attention to the aspects of life that are most important to the patient—but none of the restrictions. There is no need to forego cure-directed therapies in order to receive palliative care. There's no requirement that a patient have a terminal illness with a limited life expectancy. All other care can proceed as it did previously, with palliative care providing an additional layer of support to patients and families. But when I enter a room and patients see "Hospice and Palliative Medicine" on my ID badge, they often balk and shut down before we've even begun speaking. The help that I can offer is blunted by patients' wariness and other doctors' reticence to consult my team.

So I try, whenever possible, to educate anyone I encounter—students, trainees, attending physicians, nurses, social workers, families—about what the palliative care team can offer. But as a hospice and palliative medicine fellow, I still have a lot to learn. In fact, I continually discover just how much I have yet to know.

> There is no need to forego cure-directed therapies in order to receive palliative care.

### CARE FOR THE SOUL

**Earlier this year,** I spent an elective month with the team of multifaith chap-

lains at Rhode Island Hospital. My goal was to deepen my exposure to the core beliefs and traditions of various faiths in order to better serve patients and families during times of grave illness and at the end of life. With only a few years of tepid Lutheran practice in childhood and assorted anecdotes about different faiths garnered from friends with varying levels of devotion, I often feel ill-equipped to address my patients' spiritual needs. What I learned, though, was that the questions I set out to address weren't even the ones I should be asking.

It turns out that chaplains, too, are misunderstood and underutilized. Their introductions are at times met with a polite but firm, "No thanks, I'm all set," as patients decline what they assume will be an offer of prayer or a conversation centered around religion. Patients and providers alike often equate the chaplains' very presence with bad news or impending decline.

But chaplains, in fact, offer support, companionship, an open ear. They meet patients where they are in the moment and respond to whatever spiritual distress they are experiencing, be it the toll of a diagnosis, a loss of purpose, a crisis of faith. Shock and grief are certainly emotions they address frequently. But so, too, are humor, compassion, and love.

On my first day rounding with a chaplain, we visited a woman who had had multiple hospitalizations. We talked about the time she had spent with her family since her last admission, symptoms that had been particularly troubling, and how much of her illness she and her husband had shared with their small children. As tears streamed down the patient's cheeks, the chaplain noted gently that these in no way indicated a loss of the strength that she fought so hard to maintain. The chaplain had been a consistent presence throughout the patient's ordeal. There had been little talk of faith and infrequent prayers, but so much care delivered.

> There had been little talk of faith and infrequent prayers, but so much care delivered.

Later we met a woman who had been hospitalized for more than a month. Within the first minute of our interaction, when asked what carried her through the hard times, the woman responded candidly: "My faith in God. Without that, I would never have made it this far." The chaplain explored the woman's faith, her image of God, and how these had been influenced by her family and upbringing. Her questions unearthed grief for a lost sibling and strain in the patient's relationship with a surviving relative. The woman requested a prayer, and when we left she was visibly more relaxed than when we had arrived.

Despite her prolonged hospitalization and the integral role of religion in her life, this woman had never had a visit from a chaplain. Perhaps this was because her condition and course up to this point had been too severe and complex for her team to turn their attention away from test results and treatment plans. She did ultimately receive spiritual care, though only because we had been consulted for another patient on the floor and asked the team if any other patients might also benefit from such support.

Although this patient was devout and wanted the chaplain to pray with her, there are many others who do not follow any religion who could benefit. As a result, when we as the health care team either fail to offer spiritual support or are unaware that the scope of such care encompasses far more than the teachings or practices of a particular faith, we fail to provide our patients with the full range of interdisciplinary care that our institution can provide.

In the multifaith chaplains I found a team so much like my own: a group of people eager and well-equipped to provide care, who can ease the illness experience of many patients and families, but who are often overlooked and misunderstood. I was also chastened to recognize my own lack of knowledge. If I, as a physician who often deals with bad news and impending decline, was unfamiliar with the depth and range of spiritual care available, certainly it was unfair to expect any different from anyone else.

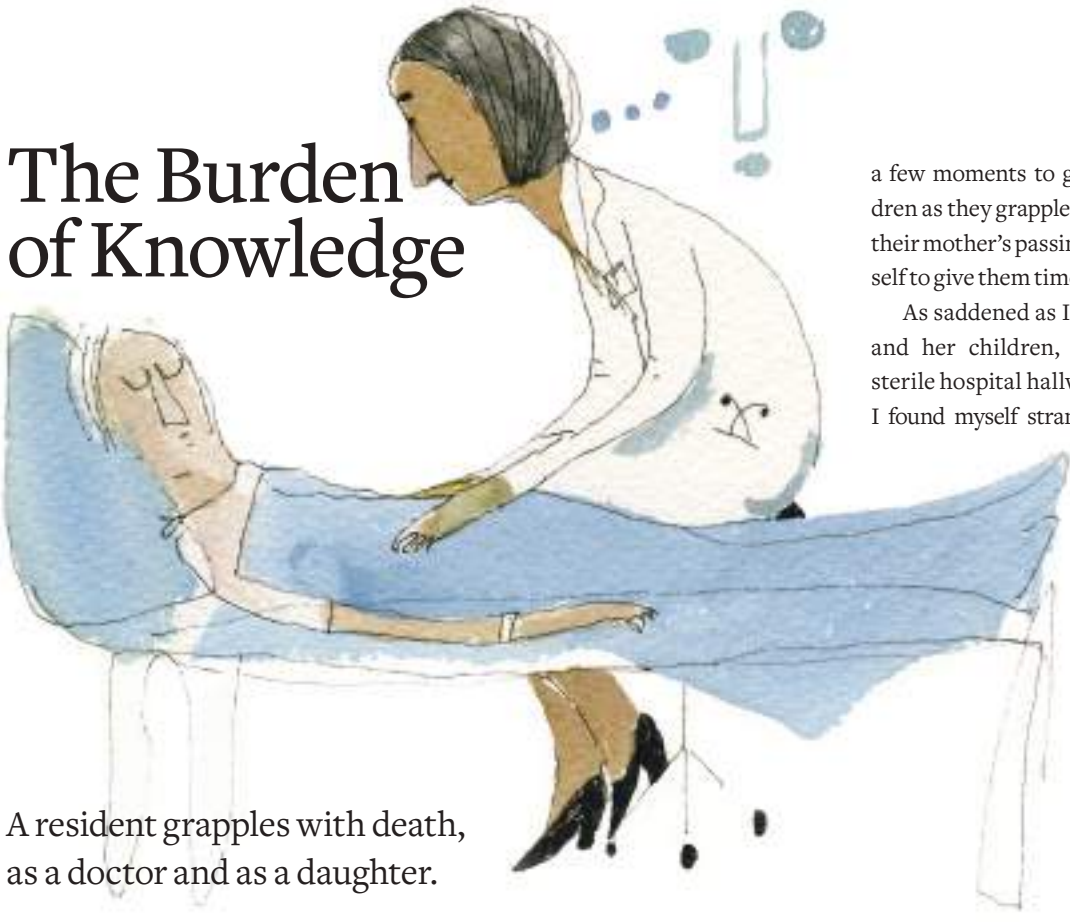
We can all do better for our patients. But in order to broaden the horizons of the care we deliver, we must first broaden our own.

**Rebecca MacDonell-Yilmaz**
*is a fellow in pediatric hematology/oncology at Hasbro Children's Hospital. She completed her residency in pediatrics and her hospice and palliative medicine fellowship at Brown. In her free time, she enjoys writing, running, and spending time with her husband and sons.*

## RESIDENT EXPERT

BY MINOO D'CRUZ '11 MD'16 RES'19

# The Burden of Knowledge



BLAIR THORNLEY

A resident grapples with death, as a doctor and as a daughter.

**If I only knew then what I know now.**

As I drove home after a long overnight shift on inpatient adult medicine, this thought engulfed me, seeming to fill every crevice of my mind, evoking a strange mix of regret and calm.

During the night, I had cared for a dying elderly patient as her family stood vigil. After a tumultuous hospital course, the patient had entered multiorgan failure and my compatriots taking care of her during the day had held a series of family meetings that led to her current CMO (comfort measures only) code status. "She may die tonight," I was alerted during our sign out. Her family members knew of her somber prognosis, and we were initiating her on a morphine drip for pain and terminal dyspnea when I went to introduce myself.

Through the course of the night, I checked on them at regular intervals, gathering fragments about the patient's life and what she had meant to her children. It is an unfamiliar feeling to "manage" the dying process of a patient as a resident when the majority of your medical training thus far has focused on interventions to extend life. As it turns out, it can often be the most valuable skill the profession provides. Her eldest daughter paced around her bed, asking detailed questions about the patient's current symptoms and expected course, while her youngest sat quietly to the side, focusing on her mother's face while holding her hand and stroking it gently.

Around 2 a.m. the nurse paged me to evaluate the patient. She appeared to have stopped breathing. I entered the room, feeling the weight of the silence of her children. I performed the methodical exam my senior had reviewed with me earlier in the night, and verbally announced the time of death. I lingered for a few moments to grieve with her children as they grappled with the finality of their mother's passing, then excused myself to give them time alone.

As saddened as I was for this patient and her children, walking down the sterile hospital hallway to our call room I found myself strangely envious. Seven years prior, as a junior in college, I lost my own mother to non-Hodgkin lymphoma. Despite her initially positive prognosis, she declined rapidly over six months with profound neurological impairment secondary to multiple brain metastases. She underwent numerous rounds of chemotherapy followed by whole brain radiation. I had visited her in India several times during those months, but only my father was present in the hospital at her death.

I am told my mother did not suffer at the end. Knowing what I know now, I struggle to reconcile with this reassurance, yet I am unable to alter the course of her illness or the end of her life. The burden of knowledge is intolerable. But when the waves of guilt finally recede, as I crawl into bed in the early hours of the morning, in the stillness I find some solace in the night that has transpired under my watch.

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**Minoo D'Cruz** *is a family medicine resident at Brown. She grew up in Oman, and was a human biology concentrator. She is interested in global maternal and child health and plans to practice full-spectrum family medicine, including obstetrics.*


# Blood

**TRIAL BY FIRE** Kurtis has studied malaria since he contracted it as a PLME student. His lab's discovery of a new target to attack the *Plasmodium falciparum* parasite is now the basis of an experimental vaccine.

BY SARAH C. BALDWIN
PHOTOGRAPH BY DAVID DELPOIO

# Born

Malaria didn't manage to kill Jake Kurtis. He wants it to stop killing others.

**JONATHAN "JAKE" KURTIS** '89 MD'96 PhD'96 believes in the importance of first exposures. "Your first exposure galvanizes you," he says. "Everyone who is really serious about global health remembers their first experience."

Kurtis's first exposure to what would become his life's work almost led to his demise. In 1987, during his junior year, the geology-biology concentrator and Rhode Island native was in Kenya researching coral reef ecology. In the dining car of the night train from Nairobi, where he'd been collecting supplies, to Mombasa, where he was staying in a hut on a deserted beach miles from the nearest town, he stumbled on some Americans. Together they threw back several bottles of Tusker, the iconic Kenyan beer. By the

"Everyone needs a champion in life. Jake was mine."

time the train pulled into the station the next morning, Kurtis was suffering from fever, massive headache, and some cognitive impairment—signs he had possibly contracted malaria. Somehow he got himself to his hut and collapsed.

"I don't remember anything that happened for the next three days," he says, "except when I did wake up, I opened my three foil packs of Fansidar tablets and took them, just as my physician from The Miriam's pre-travel medicine clinic had told me to do if I got sick."

That physician was G. Richard Olds, MD, an infectious disease doc specializing in tropical diseases, whom Professor of Medicine Charles Carpenter, MD, had recruited to Brown from Case Western in 1983. Carpenter, Olds, and then-Dean David S. Greer, MD, formed the International Health Institute, which Olds directed. When Kurtis returned to Providence, he got his follow-up care from Olds and the two grew close.

But Olds didn't just save Kurtis's life. Before long he would also introduce him to his life's purpose.

The son of a Brown pathology professor and a member of the first PLME cohort, Kurtis was "markedly undirected" as an undergraduate, and he was not exactly loving his medical school years, either. Overwhelmed by what he saw as "too much memorization and not enough science," he entered what he calls an "intellectual depression." He confided in Olds that he planned to drop out. Olds convinced him not to, instead urging him to enroll in Brown's MD/PhD program and work in his lab.

And that was Olds's third gift, for it was in his lab that Kurtis met and fell in love with Jennifer Friedman, MPH, PhD '92 MD'96. Then a senior, Friedman was working on schistosomiasis, a devastating disease caused by parasitic worms. The female worm lies inside the male's gynecophoric canal, Kurtis explains, "so they're mating 24/7. Jen's job was ripping apart the male and female worms and looking at their biochemical signal transduction screams of anguish. That threw me into a complete romantic frenzy."

That experience cemented his love of research. Following a postdoctoral fellowship at Walter Reed Army Institute in Kenya, where he studied malaria vaccine development, Kurtis did his residency in clinical pathology and his fellowship in transfusion medicine, both at the University of Pennsylvania. He returned to Brown in 2000 as an assistant professor in the Department of Pathology and Laboratory Medicine—the very department of which he was appointed chair in July.

## ENDURING PASSIONS

**For Kurtis, research was no passing fancy,** and neither was Friedman: the couple got married in 1996 and they have three children—and they're still passionate about protecting people on a large scale from infection and disease. They even started a lab together.

In 2005, armed with $500,000 a year in grants from both the NIH and the Gates Foundation (whose Grand Challenges in Global Health had just put malaria in the crosshairs of the medical and public health communities) and with the help of Lifespan's then pathologist-in-chief Ron DeLellis, MD '62, the two physician-scientists moved from the Biomed Center on College Hill to the Pierre Galletti Building in the Jewelry District.

Twelve years later, their external funding is in the millions, and their lab—the Center for International Health Research—now houses 10 full-time scientists, not to mention numerous postdocs, grad students, and undergrads. Between them, Kurtis and Friedman are principal investigators on eight NIH grants and two COBRE cores, and have completed or are working on population-based studies in the Philippines, China, Kenya, Tanzania, and Brazil.

Placing themselves squarely between the scientists in Brown's labs and the clinicians in the affiliated hospitals was no accident. "I think that the questions that we need to ask and answer are at the interface of descriptive epidemiology and very mouse-oriented, basic science," Kurtis says. "If you're going to do that, you need to have the language of epidemiology, biostatistics, molecular biology, and immunology. That's what our team is about. While none of us is an expert in all these disciplines, each member must embrace some kind of common lexicon. You have to have people who are motivated to get out of their academic silos." Kurtis and Friedman built the center on this philosophical foundation, the conviction that the biomedical discoveries that improve human health occur at the intersection of field and lab science.

## NOT YOUR GRANDFATHER'S PATHOLOGIST

**Following Kurtis around** CIHR's lab space, it's easy to forget he's a pathologist. He's as much a parasite hunter as he is a people person. Though he can rock a Brooks Brothers shirt and trousers as well as the next guy, he's most comfortable in shorts, a T-shirt, and Keens. His irrepressible boyishness is offset only slightly by the silver in his hair. Ambling

among protein purifiers, incubators, fermenters, high-speed multichannel pipetting robots, centrifuges, tissue culture machines, and banks of freezers containing 87,000 samples of human blood and placenta specimens, he pauses to talk to everyone he meets, peppering his often-colorful language with an enthusiastic "*Dude!*" and offering high fives—including to the undergraduates working there.

"Connection to students is so important," Kurtis says, "looking them in the eye, understanding how overwhelming it is to be a student. These folks are drinking from a fire hydrant. They're not going to remember everything you say, regardless of what tools you use, so teach them the one or two critical things that they *will* remember. You have to make it real for them." He's been teaching a long time: even as an MD/PhD student, he served as Olds's TA for the wildly (and still) popular course UC107, "Burden of Diseases in Developing Countries." Kurtis travels each year to Grenada to teach for a week at St. George's University, where Olds is CEO and president. Says Olds: "Last spring, at the end of his week, he got a standing ovation from the students. *I* don't get a standing ovation!" Not surprisingly, the Medical School has awarded Kurtis the Dean's Excellence in Teaching Award at least seven times.

Perhaps because of the life-altering mentorship he received from Olds and others, Kurtis invests deeply in his mentees. One of those is Christian Nixon MD'08 PhD'08, whose thesis (for which Kurtis was the adviser) involved doing the very "DNA gymnastics," in Kurtis's words, that revealed the antigen that is key to their vaccine candidate. After earning his MD/PhD from Brown, Nixon went on to complete postdoctoral work at UCSF, Yale, and the Eijkman Institute in Indonesia. Kurtis followed his career closely, finally recruiting him back to Brown in 2014—in a way, replicating Kurtis's own experience. (They even share a similar kinetic, buoyant intensity as well as a certain irreverence.)

Nixon is now an assistant professor in the Department of Pathology and Laboratory Medicine and runs a lab at CIHR focused on developing vaccines to prevent transmission of malaria from human to mosquito and identifying new vaccine targets that protect young children from severe disease. "Everyone needs a champion in life," Nixon says. "Jake was mine."

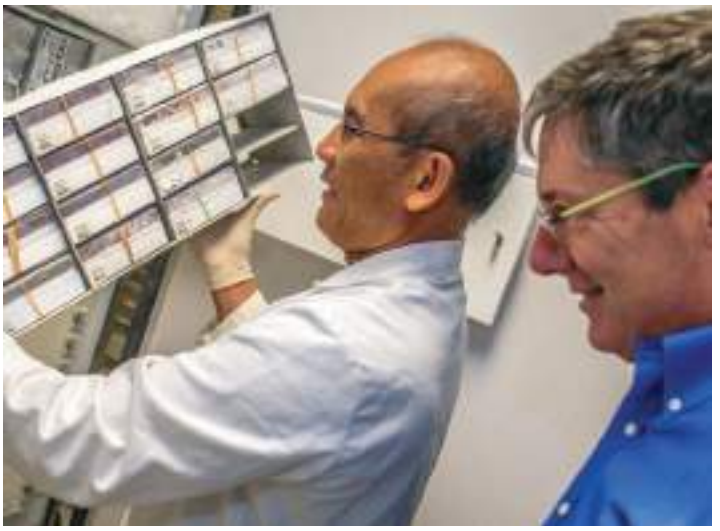
Indeed, for all his talk of molecules, antigens, and epidemiology, Kurtis sees himself as a doctor first. "Despite my first impressions during medical school, I actually really enjoy patient contact," he says. He regrets that as chair, he won't

KEVIN KERTSCHER

**IN THE FIELD: Jake Kurtis (in the blue shirt) walks with Florence Amollo, a health outreach worker, near Ahero, Kenya, in September. They visited villagers to begin community preparation for a new NIH-funded study of his lab's malaria vaccine candidate.**

be able to spend as much time with patients, but he will continue to see them. As associate director of transfusion medicine and coagulation at Rhode Island Hospital (where Nixon is also an attending physician), he takes a very hands-on, even therapeutic role in the management of bleeding, strokes, and clots and the use of anticoagulants and procoagulants.

That focus—on the people who live with and die from disease and not just on the mechanics of it—might explain why, when it comes to exact malaria mortality rates, Kurtis doesn't really care what statistics the experts in Geneva come up with. A child every minute? Every two? What's the diff? What matters is the disease is treatable and preventable, and it's killing kids.



**LAB PARTNERS: Sunthorn Pond-Tor of the Center for International Health Research, left, selects frozen plasma samples from malaria cohort studies for analysis.**

## DNA GYMNASTICS

**Kurtis and Friedman,** CIHR's director, are waging war against a pair of tropical diseases that hit children especially hard. Friedman, a pediatrician and "card-carrying epidemiologist/biostatistician," in her husband's words, has published extensively on schistosomiasis, the world's second-most devastating parasitic disease, including a recent study showing that the drug praziquantel is a safe and effective treatment for pregnant women.

Kurtis has his sights set on malaria—the greatest single-agent killer of children on the planet. And while he may not get hung up on numbers, they are pretty dire.

Though it has been eliminated from Western Europe since the 1930s and the US since the 1950s, malaria still threatens almost half the world's population. The World Health Organization estimates that in 2012, 637,000 people died of malaria, 482,000 of them children. That's a child a minute. In sub-Saharan Africa and Southeast Asia, it's a child every 15 seconds.

To Kurtis, this is unconscionable—and not just because we're talking about dead children. Viewing its ravages at the societal level, he calls the disease a "culling machine" and a "great thumb" keeping entire populations down. Indeed, Martin Edlund, CEO of the nonprofit Malaria No More, has said that ending malaria in the next 25 years would save 11 million lives, prevent 4 billion cases, and result in $2 trillion in economic benefits in the developing world.

Kurtis puts it more succinctly: "Where malaria prospers, people don't."

That's why for him, finding an effective antimalarial vaccine will have global health repercussions on par with the polio vaccine's. He and others, including pathology and laboratory medicine department colleagues Nixon and Dipak Raj, PhD, and collaborators from the NIH's National Institute of Allergy and Infectious Diseases, hope they are on their way to doing just that. In 2014, they published a study in *Science* that showed encouraging results for a novel vaccine candidate.

Malaria is caused by a single-cell parasite transmitted through the bite of an infected female mosquito. Once it enters the body, the parasite migrates to the liver and multiplies 10,000 times, eventually bursting into the bloodstream and infecting red blood cells. While most vaccine candidates are aimed at preventing the parasite from entering the red blood cells, Kurtis and company have identified a protein that prevents it from *exiting*. The infected cells are then filtered out by the spleen.

This approach didn't come out of nowhere. It took a decade of collaboration, multidisciplinary expertise, and those "DNA gymnastics" to get here. It also took what Olds calls Kurtis's "incredible intellectual tenacity." The scientists studied a birth cohort of 750 children in Tanzania, where *Plasmodium falciparum* malaria is endemic. While 94 percent of the children were susceptible to the disease, 6 percent proved resistant, thanks to an antibody they produce that recognizes—and attacks—the protein the parasite needs to escape the red blood cell. This protein is the key to Kurtis's vaccine, which will address under-5 mortality.

"[They] might still get infected, but [they] won't die. I'm all for not dead," Kurtis says. The vaccine is approaching phase 1 human clinical trials; all they need is funding.

DAVID DELPOIO

(Another vaccine candidate is in the pipeline, according to Kurtis, but it's too soon to talk about it.)

## SERIOUS SCIENCE

**Like a gifted polyglot,** Kurtis is fluent in many modes of thought, moving easily from the molecular to the organismic to the population level and back again. Similarly, he believes that for an approach to disease eradication to be effective, it must be at once multidisciplinary and translational. That is why he, a pathologist, surrounds himself with epidemiologists, biostatisticians, cell biologists, molecular biologists, and immunologists. It's also why he, a physician-scientist, wants his department to develop a "balanced portfolio" of basic, translational, and clinical scientists.

"A major powerhouse would be something like 65 to 75 percent master clinicians, 15 percent translation-oriented research clinicians, and 10 to 15 percent NIH-oriented basic science researchers," he says. "So much low-hanging fruit exists in basic science laboratories, but the results … have not sufficiently translated to new therapies or diagnostics. Pathology is the poster child for moving from the bench to the bedside." He hopes to add three MD/PhDs to his faculty.

This direction is well aligned with the vision that Dean of Medicine and Biological Sciences Jack A. Elias, MD, has elaborated in his 10-year strategic plan, which aims to turn the Division of Biology and Medicine into a thriving translational medicine enterprise. The recently formed Brown Institute for Translational Science, or BITS, is the cornerstone of that plan. A 2016 gift from The Warren Alpert Foundation of $27 million, most of which is earmarked for reviving Brown's MD/PhD program—the *sine qua non* of any medical school that wants to excel in disease-focused translational research—includes $5 million to be used to create BITS's first endowed professorship. Kurtis is eager for greater collaboration between BITS and Lifespan's Clinical Research Center, a facility created to support clinical investigators conducting research on experimental therapies and devices. "You can have all the great ideas you want to translate," he says, "but if you don't have a place to actually enroll humans, it becomes really hard."

Kurtis, who now directs the newly named Warren Alpert Physician-Scientist MD/PhD and Advanced Training Program, also wants to make his department's residency and fellowship programs more research oriented. Expanding the fellowship to three years, for example, two of which would be dedicated to research, would enable fellows to prepare for their academic career while enlarging the department's "academic footprint." It would also create a path for turning postdocs into junior faculty, something that's important to him.

## WHAT DOESN'T KILL US…

**Through the plate-glass windows** of his office on the third floor of the Galletti Building, Kurtis can gaze southward at the factories-turned-medical facilities of the Jewelry District and eastward, toward College Hill. The views remind him that he sits where the action is when it comes to translating research into cures. Recently named the inaugural Stanley M. Aronson Professor of Pathology and Laboratory Medicine—a professorship endowed by former Chancellor Tom Tisch '76, P'18, P'20 and Alice Montag Tisch P'18, P'20 in honor of the renowned pathologist and founding dean of Brown's Medical School—he is nevertheless modest and straightforward about what he's trying to do: "My job is to put pills in bottles."

> "They might still get infected, but they won't die. I'm all for not dead."

When he thinks about his encounter with—and survival of—malaria, Kurtis takes a rather Nietzschean view. He considers it a boon. "I wondered for years, What is my purpose on the planet? I was turned onto a life's pursuit at age 20. Most people aren't lucky enough to have that happen."

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# A RACE AGAINST THE CLOCK

BY PHOEBE HALL
PHOTOGRAPH BY KAREN PHILIPPI

In sepsis, every second counts. But the hunt for a sure-fire cure seems to be stuck on the starting line.

**Until January 2014,** Victoria Morrone, RN, had always been pretty healthy. As a CNA and nursing school student at the time, she knew about sepsis, but it was the last thing on her mind when she caught a cold. She remembers downplaying her illness, reassuring her husband, Joe, even as she was being loaded into an ambulance to the hospital, "I'll be fine."

**SURVIVING SEPSIS**
**Vicky Morrone lost her right leg to sepsis in 2014. Now a nurse, she hopes to one day work in critical care. "I feel like that's where I should be," she says.**

Morrone is blond and petite, with a warm smile. She's straightforward as she recalls that winter when everything changed. She was 30 years old and on break from school, enjoying time at home in Westerly, RI, with her infant son and two older kids, when she was diagnosed with an upper respiratory infection. She and her doctor didn't want to harm her breast milk supply, and elected to treat it with amoxicillin. It didn't work.

"It was very, very quick," she says of her decline. At the local emergency department Morrone was diagnosed with pneumonia and acute respiratory distress syndrome (ARDS), and put in a coma. She tells what happened next as though she's narrating someone else's story: the failed first attempt to place a central line, which missed and punctured her lung; the four chest tubes; the femoral line in her right leg. As her blood pressure cratered she was packed into an advanced life support ambulance and rushed through a snowstorm to Providence. A priest was called to give last rites. Her little brother, who was serving in Afghanistan, was flown home to say goodbye.

In the Rhode Island Hospital ICU the medical team found her right leg was in rigor. A fasciotomy stabilized her vitals, but it couldn't save her limb. "It was dead and it was taking me with it," Morrone says. "They called my husband because he was with our kids at the time, and asked for permission to take my leg. And they said if they don't take my leg, I will die. And if they take my leg, I may still die." With Joe's consent, surgeons amputated her right leg above the knee in the ICU. "They couldn't stabilize me enough to bring me to the OR," she says.

Three years later, Morrone became the first person in the state to graduate from a nursing program with a prosthetic leg. She's working at a nursing and rehab center, and she and Joe celebrated their 10th anniversary in August, on Marco Island in Florida. "It was beautiful," she says. "But it's, you know, that could have not happened." Their kids are 9, 6, and 4 now. "My oldest has almost PTSD. Every time I leave, he needs to know when I'm coming back," Morrone says. "My daughter, every once in awhile, will start to get teary and say, Mom, you almost died and I didn't have a mom."

The many weeks away from the baby, Oliver, during her illness and recovery, still weigh heavily on her. He might never have known his mother, she reflects, her eyes filling with tears. "But he doesn't—for him, he doesn't know any different," she says. "Mom just puts on her leg every day."

## EQUAL OPPORTUNITY KILLER

**Morrone says no one knows** exactly when sepsis set in: whether the infection began in her lungs before she went to the hospital (doctors later determined she'd had H1N1 flu, not a cold), or in her leg after the femoral line was placed, or somewhere in between. But that chain of events—healthy young mother gets a lung infection and loses a limb—was a tragically familiar one to Professor of Medicine Mitchell Levy, MD, MCCM, FCCP, who, as the director of the medical ICU at Rhode Island Hospital, was part of the team that cared for her. "People get sepsis from cutting their hand. Young kids die," he says. "No one's immune from the ravages of sepsis."

Sepsis isn't a disease; it's not caused by a single agent, nor does it affect any one organ. It's a physiological condition, a dysfunctional response to an infection—usually bacterial, but sometimes caused by a fungus, virus, or parasite—in which the immune system turns on itself, damaging tissues and organs. There's no simple test for sepsis, yet if it's not rapidly identified, or treatment is administered too slowly, organs fail, blood pressure plummets, and death quickly follows.

For decades, its prevalence, and its lethality, were underappreciated; the NIH didn't even fund sepsis research until recently, Levy says. In the US alone it sickens 1.6 million people annually and kills more than a quarter million of them; it's the No. 1 killer of hospital patients, and the third leading cause of death overall. As the population ages, it will only get worse: the elderly, along with newborns and other immunocompromised people, are most vulnerable to sepsis, but it can, and does, strike anyone.

At first glance it seems there's no rhyme or reason to who gets sepsis. Most of us can get the flu, or a nick while shaving, and be just fine; but in an unfortunate few, the immune system overreacts, taking organs down like dominoes. But why? Researchers believe it's an ideal case for personalized medicine: if they can find genetic clues that indicate individual susceptibility to sepsis and, furthermore, the most effective therapy for each patient, maybe they could stop sepsis before it starts.

But here's the trick: can this be done really, really fast?

Because clinicians have minutes, not hours or days, to diagnose sepsis and begin treatment. "We know there is a pattern of genomic response," Levy says. But without a rapid diagnostic, all this genetic know-how won't save the patient. "They say in cardiology, time is muscle," Levy says. "The same thing is true for sepsis. We say time is tissue."

## NEEDLE IN A HAYSTACK

**Talk to a sepsis specialist** and at some point they'll tell you how much they envy people who study and treat other disorders. A heart attack has a discrete beginning and end. Flu has a definitive agent. Cancer can be biopsied. But no one goes into sepsis research because it's easy.

"It's the Bermuda Triangle" of drug research, says Steven Opal, MD, a professor of medicine. It's financially too risky for small pharmaceutical companies; larger ones have gotten cold feet after high-profile failures and plummeting stock values. "A company needs to be very brave, very silly, or have lots of money in order to do these studies," he says.

As the codirector, with Levy, of the Ocean State Clinical Coordinating Center (OSCCC) in Providence, Opal has shepherded a number of potential sepsis drugs through clinical trials, only to see them all flame out. "It's a little depressing," he says. "There's been some spectacular failures." He was lead author of a 2014 paper in *Critical Care Medicine* that called for overhauling the approach to sepsis drug research and testing. "Hundreds of millions of dollars have been expended enrolling over 30,000 patients in clinical trials," the authors wrote. "Yet, not a single agent has convincingly proven to be consistently efficacious in clinical trials. There are no new drugs on the market to show for all this effort."

With its constellation of symptoms, sepsis is difficult to diagnose precisely and, thus, to define a clear patient cohort across centers in large clinical trials. With no one pathogen, there's no one thing for a drug to attack. Anti-endotoxin drugs, immunomodulators, and anticoagulants all have failed. Though inflammation is a hallmark of sepsis, no anti-inflammatory agent has panned out. Activated protein C, the only drug ever approved to treat septic shock, was taken off the market after 10 years when the results of the first phase 3 trial couldn't be duplicated.

Yet Opal is relentlessly optimistic. "We've been able to slowly convince Big Pharma that this is still an important unmet medical need and needs to be solved," he says. He has high hopes for three international drug trials that OSCCC is managing, including two potential therapies for complications of septic shock, both in phase 3; and a small phase 1 trial for a Bristol-Myers Squibb immunotherapy drug, nivolumab, that's had some success in cancer patients by using programmed cell death 1 (PD-1) antibodies to activate T cells. "We're all excited about it," Opal says.

> "They say in cardiology, time is muscle. The same thing is true for sepsis: time is tissue."

Alfred Ayala, PhD, a professor of surgery (trauma) (research), has been trying to understand why some people are predisposed to immunosuppression and sepsis since he was a postdoc at Michigan State. Some of his findings in the 2000s about PD-1, which is a type of immune checkpoint protein, formed the basis for the development of nivolumab and one other immunotherapeutic. Ayala says that while in certain cancers the cell death processes of PD-1 stop the uncontrolled division of tumor cells, in sepsis, where the immune system is dangerously hyperactive, it acts as a brake on T cell responsiveness. "The downside is ... all branches of the immune system are affected by these agents," Ayala says. "It's not a panacea."

Checkpoint proteins like PD-1 have another interesting

# SEPSIS IN THE US

#1
**CAUSE OF DEATH IN HOSPITALS**

Kills
1 person
every
2 minutes

#1
**COST OF HOSPITALIZATION**
$24 billion
**PER YEAR**

1.6 million
**PEOPLE INFECTED**

258,000
**DEATHS PER YEAR**

## Common infections that lead to sepsis

| | |
|---|---|
| **LUNG INFECTION** | **35%** |
| **UTI** | **25%** |
| **GUT INFECTION** | **11%** |
| **SKIN INFECTION** | **11%** |

58%
**OF ADULTS HAVE HEARD OF SEPSIS—LESS THAN EBOLA**

38
**AMPUTATIONS PER DAY RESULT FROM SEPSIS**

#3
**CAUSE OF ALL DEATHS, MORE THAN PROSTATE CANCER, BREAST CANCER, AND AIDS COMBINED**

SOURCES: SEPSIS ALLIANCE, CDC

attribute: Ayala says they seem to be overexpressed in the sickest patients, and may point to biomarkers that could someday help clinicians identify a predisposition for sepsis, or if they're already sick, what therapy might work best. "There seem to be families of genes that are being altered and dysregulated, as well as cell populations within the immune system that seem to be altered," he says. His lab is investigating what role checkpoint proteins play in that immune dysregulation, and on what cells they're expressed. "Understanding these various immunosuppressive agents made many of us think these things may be changing because of the impacts of something outside the gene itself," Ayala says—that is, epigenetic factors like diabetes, high blood pressure, aging, and other stressors that might alter gene expression and predispose someone to immune dysfunction and sepsis. "Now, we don't understand what all those predispositions are," he adds. "Otherwise, we wouldn't have this conversation and I wouldn't be here."

But Ayala does know there won't be a single biomarker that identifies all potential sepsis patients: just as sepsis is marked by a constellation of symptoms, there will be a constellation of biomarkers that, taken together, indicate someone's level of risk. "One of the big challenges with this field is that understanding the backgrounds of individuals also plays a role, in that your immune responsiveness or your organ responsiveness is all selectively individualized," he says.

Sepsis shares some of the complexities of cancer, Ayala says. Cancer used to be thought of as one disease; now "we understand that cancer is a constellation of diseases. We are beginning to wrap our heads around that in sepsis," he says. "Sepsis of a neonate may not be sepsis of an older person, may not be sepsis of a young person in between. … Even as we understand it, as we personalize it, then maybe we can understand our models better and put them into better context."

That's why he believes, as with cancer, personalized medicine is poised to play a huge role in his field. "I would be happy if anything we did could help even a few people. That would be nice," Ayala says. "As excited as I am about some of the proteins and gene targets we're looking at, we still need to know what patient will best respond to this agent. … Right now, those tools are a little beyond us." More specific patient recruitment for clinical trials could be one way to move drugs forward. Nivolumab, for instance, may only help septic patients who express high levels of the PD-1 target, Ayala says; but until there's a rapid genetic test to identify those individuals, researchers can't be sure why the drug did or didn't work.

Opal agrees. "The current thinking is that if you pick the patient population just right, then you could show these things could work," he says. "The idea that every septic patient is going to behave the same as the next is pretty much passé."

One thing that is the same across all patients is sepsis happens fast—in hours, even minutes. Patient survival depends on clinicians figuring out why they're sick and just as quickly administering the appropriate therapy. Tools for rapid, precise molecular phenotyping and diagnostics, to predict the patient's immune response, identify the infectious agent or injured organ, and choose the correct treatment, are in development, and Opal believes they'll be in clinical use within the decade.

"This is a great unmet medical need," he says. "We, as sepsis researchers and ICU docs, are actually adding to the [antibiotic] resistance problem. We are encouraging em-

"The idea that every septic patient is going to behave the same as the next is pretty much passé."

piric antibiotics because we know it saves people's lives." Getting a culture report in an hour, not a day, could take the guesswork out of antibiotic selection, and give the patient a better chance.

## BE ALARMED

**Absent a cure, or diagnostics,** or personalized medicine, prompt identification and treatment are the best hope for sepsis patients. Levy cofounded the Surviving Sepsis Campaign, an international effort to raise awareness, improve clinical care, and reduce sepsis deaths, in 2002. They called for routine screening of all patients, published guidelines for sepsis management, and developed treatment bundles—essentially, checklists of evidence-based practices that were designed to simplify care of a complex and fast-moving condition. A study published in the *New England Journal of Medicine* in June, of which Levy was senior author, found that for every hour it took clinicians to complete the first treatment bundle, the risk of death went up 4 percent.

"The most important thing is the initial management of the septic patient. Ensuring they get the appropriate testing and antibiotics and fluids earlier is the best thing that we can do to improve their risks and mortality," says Nathan Hudepohl, MD, MPH, the director of Quality and Patient Safety for the University Emergency Medicine Foundation. He credits improvements in sepsis diagnosis and treatment in the Rhode Island Hospital emergency department, where he practices, to education; a new series of best practice alerts (BPAs), implemented last year, that pop up in the electronic medical record; and workflow changes, including a physician stationed in public triage, who can identify at-risk patients while they're still in the waiting room. "That has had an impact on how rapidly we assess and treat patients with sepsis," Hudepohl says.

The system is far from perfect. Every patient who arrives at the emergency department is checked for abnormal vital signs and, if they meet two or more criteria, they're flagged as being at risk for sepsis. The provider then must complete the first treatment bundle within three hours: order blood cultures, administer fluids and antibiotics, and measure lactate level, which indicates whether tissues are getting enough oxygen. (If there are no signs of improvement, the BPA prompts clinicians to start the six-hour septic shock bundle.) But, Hudepohl notes, "there are other possibilities for why this person is dizzy or why their blood pressure is low. Sometimes it's hard to parse out whether it's due to a systemic infection or something else."

Amid the din of beeps and phones and chatter, Hudepohl, an assistant professor of emergency medicine, settles in at a nursing station and pulls up the current emergency department patient roster. One patient has been flagged for showing some signs of sepsis. "They probably have unstable vital signs that may be related to their trauma, like their blood pressure was a little bit low when they came in, and they probably have an elevated respiratory rate because they're in pain," he says. Regardless, clinicians initiated the three-hour bundle. "At this point, it's the best screening that we have."

The BPAs, which are used throughout the hospital, are another work in progress. The protocol, which Hudepohl helped develop with Levy and others, prompts providers to consider ordering more tests or treatment depending on a patient's vitals. "The problem is, sometimes the alerts fire too frequently and providers get a little bit overwhelmed, or just flat out ignore them," Hudepohl says. "We're trying to figure out how to refine some of them so they don't pop up so excessively."

It's a classic case of the boy who cried wolf, Levy says. "Caregivers are so busy. They want electronic alerts, because it's a way of reminding them, hey, pay attention to Mrs. Jones. On the other hand, if there's this constant voice that goes off, then you just stop listening." But more than three-quarters of sepsis patients in the US are identified in emergency departments. "You want to identify every patient with sepsis. But if the alerts trigger on too many people, you don't take the alarm seriously anymore," Levy says.

And that's concerning, because despite a drop in mortality of around 25 percent as compliance with the bundles has gone up, sepsis still kills more than one in five patients diagnosed with it. It's also the most expensive inpatient ticket item in the nation, costing $24 billion annually. With an eye on spiraling health care costs and an aging populace, in 2015 the Center for Medicare and Medicaid Services announced new accountability measures that codify the Surviving Sepsis Campaign screening and treatment protocols into federal law. While the regulations are well received in some corners, other physicians chafe. Levy, who helped write them, is well aware of the criticism.

"The era of performance measures and public reporting

is really unsettling for a lot of physicians. And there are problems with it; I don't in any way mean to imply that it's a perfect system. But this is another case of not letting perfect be the enemy of the good," Levy says. If you administer antibiotics and fluids to a patient who turns out not to be septic, he says, you're unlikely to harm them. As for antibiotic resistance, yes, clinicians should be concerned—but early, appropriate antibiotics and antibiotic stewardship can go hand in hand. "If you have any question, just give the antibiotics," he says. "But as soon as you give that first dose, you should start asking yourself, do they need another dose?"

Some critics argue that it can't be proved that regulations have improved survival. Levy counters that because the standard of care has changed, there is no longer a good basis for comparison. "People identify septic patients much earlier. People get antibiotics more quickly in hospitals" than they did before the Surviving Sepsis Campaign, he says. "It would be impossible to do a randomized controlled trial now, because everybody agrees: you have to identify these folks early. You have to measure lactate. You have to give them antibiotics quickly. So what are you going to test? Ignoring them?"

What the criticism boils down to, Levy believes, is this: some doctors think regulations impede their clinical judgment. But "we are not at the point where we can truly tailor therapy," he says. "It's true, one size does not fit all. There is some validity to that. However, we are here because docs are too busy. We often forget to do the right thing. We sometimes even forget to wash our hands. And so reminders and regulations and holding physicians' feet to the fire is a good idea."

Tracy Madsen, MD RES'12 F'14 ScM'14, an assistant professor of emergency medicine, has always worked under the Surviving Sepsis Campaign guidelines, which were first published in 2004 and have been revised three times. "The guidelines have been appropriately changed over the years to match what the data are saying," Madsen says. The BPAs haven't reduced her to an automaton—she still exercises her clinical judgment. But they raise a red flag, and in a chaotic emergency department, that's a good thing. "We know that septic patients need fluid, hydration, they need antibiotics, they need blood cultures. We also know that, in general, the faster these things happen for septic patients, the better. That's evidence based," she says. "I'm happy to do whatever is best for the patient."

Critics argue there's no proof that regulations have improved survival. But the standard of care has changed.

## AMONG THE LIVING

**As a survivor of sepsis,** Vicky Morrone's outlook is sunny. "I'm just so happy to wake up every day," she says. Kids love her prosthesis—she has to tell them, no, they don't actually want one. With a wry laugh, she points out that the recurring cyst on her right knee will never bother her again.

It's been a professional boon, too. When she was a nursing student she had a pediatric patient who also had lost a leg. "I was able to help the family so much: look, this doesn't have to negatively impact their lives," she says. Morrone appreciates her special rapport with patients who've been in the ICU. "It gives me an entirely different outlook," she says. "I sympathized but I didn't get it before. I get it now."

And when patients complain about the tests and rechecks and alerts, Morrone can speak with an authority that few clinicians can summon. "I don't think [some patients] understand how severe it can be," she says. "We're not coming in to check on them to bother them. We're coming in to check on them to make sure that nothing is changing, especially in a hospital setting. You're so acute that an hour could change everything."

**HOLE IN THE HEAD: This girl's skull was trephinated [trepanned] in 3500 BC. She survived.**

# DISCOVERING ANCIENT SKULL SURGERIES

Why are there so many tidy round holes in prehistoric skulls? Possible answers might include sword punctures, falling rocks, acid drips in tombs, or beetles and rodents gnawing at the skull after death. Paul Broca (1824-1880) had a different explanation: surgery, done on living patients. Even in the Stone Age, humans performed an operation called *trepanation*, drilling a hole in the patient's skull.

NATURAL HISTORY MUSEUM, LAUSANNE

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# THE LEGEND OF HUA TUO AND THE EMPEROR'S HEADACHES

**Old Chinese stories tell of the surgeon Hua Tuo (c. AD 140-c. 208), known as the Chinese "Father of Medicine."[10] Tuo was legendary for his ability to diagnose and cure all manner of ailments. His special anesthetic, Ma Fei San, was so powerful that patients could sleep through surgery and feel no pain; it was probably made of boiled cannabis dissolved in wine, though other traditional ingredients have been suggested.**

**According to legend, the Emperor Cao Cao was struck by unbearable headaches and called on Tuo for help. Tuo said the headaches were caused by the pressure of air and fluid building up inside the skull. To relieve the pain, he would have to anesthetize the emperor and open his skull. But Cao Cao, fearing assassination, had Tuo executed.**

**His medical secrets did not survive him. Tuo had a book—by some accounts, he received it from mysterious old men, clearly immortals, in a cave that collapsed right after he left it. Whether he relied on their magical secrets alone or added to the book from his own observations and experience, it was a valuable thing, and he left it to his kind jailer. But the jailer's wife burned it; being a great doctor was all too likely to get a man executed.**

Broca was a French doctor famous for work on the brain. He understood that different parts of the brain have different functions, and he developed a way of using landmarks on the skull to locate parts of the brain. When one of his patients had trouble talking after a closed head injury, Broca found the problem, trepanned the man's cranium, and drained an underlying abscess. He reported the case in 1876; it was the first "neurosurgery based on the new theory of cortical localization of function."[1]

Since he was also a famous anthropologist, it was only natural that anyone who wanted a second opinion on a prehistoric skull would turn to Broca. George Squier (1821-1888) did just that to resolve controversy over a skull he'd acquired in Peru. Squier thought the hole in this skull was made by an ancient American surgeon during the patient's life; members of the New York Academy of Medicine thought it was done after death. So in 1867, Squier asked Broca to examine the skull.[2]

Broca concluded the operation had been done a week or two before the patient's death; it had begun to heal. But why was it done? Squier thought it might have been a response to head trauma, but no visible cracks in the skull confirmed that idea. Had there been a closed head injury? Maybe the Incan surgeon had operated to relieve pressure, just as Broca himself would have done.[3]

Neolithic humans had practiced trepanation, largely on children, to cure some problem.

The Peruvian skull excited French anthropologists, and soon they were unearthing ancient skulls in France. Broca's friend P. Barthélemy Prunières discovered many with large openings, and near them he found rondelles—round pieces of cranial bones, polished and shaped like amulets. Broca


By **Marguerite Vigliani, MD,** and Gale Eaton
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came to believe that Neolithic humans had practiced trepanation, largely on children, to cure some problem; he thought the rondelles were "tied to primitive religious beliefs."[4] Many researchers have accepted Broca's ideas. If Neolithic humans thought seizures were caused by demons that escaped through the holes, maybe they also thought children who survived were sacred, and amulets made from their skulls had power. It's a theory.

Since Broca's time, anthropologists around the world have found hundreds of trepanned skulls. Some European examples are more than 10,000 years old, and North African ones are even older.[5] Broca was right to think cranial surgery dates back to the Stone Age.

But was he right about why it was done? Answers may vary with culture. Some trepanations may have relieved pain or pressure in the head. In ancient Peru, Denmark, and China, it seems likely that warriors were trepanated after right-handed enemies bashed them on the left side of the skull.[6] In today's Kenya, the Gusii people remove fractured bone after head trauma.[7]

Classical Greek and Roman writings recommended trepanation for head injuries with or without fracture,[8] and we now regard putting holes in the head as the correct way to release a buildup of old blood or pus under the skull.[9] Trepanation may have been humanity's first surgical discovery.

And Paul Broca, investigating early examples of it, was pioneering a new area of medical research: paleopathology, or the study of ancient illnesses. Broca was a physician, an anatomist, and an anthropologist; today's paleopathologists are trained in even more disciplines. Using research tools that range from DNA sequencing to CT scans on the remains of ancient humans, they find new answers to old questions.

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# ALUMNI ALBUM

## CHECKING IN WITH BROWN MEDICAL ALUMNI

**IN SICKNESS AND HEALTH**
**Marcos Aranda '13 MD'17 received his commission as a captain in the US Army at a campus ceremony in May, and then turned and proposed to fellow med student and Army Second Lieutenant Uzoamaka Okoro '16 MD'20. (She said yes.)**

NICK DENTAMARO

## CLASS NOTES
## ALUMNI

### 1980

**Mark Nunlist**, MS '70 retired from White River Family Practice in White River Junction, VT, where he was a partner. In 2010 Mark earned his master's from the Dartmouth Institute for Health Policy and Clinical Practice at the Geisel School of Medicine, where he was a clinical assistant professor of community and family medicine. He and his wife, Cathryn J. Cummings Nunlist, JD '70, live in Lebanon, NH.

### 1981

**David M. Carlisle**, PhD, president and CEO of Charles R. Drew University of Medicine and Science (see *Brown Medicine*, Spring 2017), was the keynote speaker at the commencement ceremony of University of California, Riverside's School of Medicine, which graduated its first cohort this year.

**BUZZWORTHY**

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

## 1983

**Richard M. Toselli** became chief medical officer of InVivo Therapeutics in Cambridge, MA, in July. A neurological surgeon, he joined the biotechnology company, which focuses on spinal cord injuries, after serving as chief medical officer of Cochlear Limited. He has held academic positions at Brown, the University of North Carolina, and the University of Vermont.

## 1986

**Robert W. Panton** '83 MMSc'86 was elected speaker of the Illinois State Medical Society during its 2017 annual meeting. An ophthalmologist, he has been a member of ISMS since 1987, participating on numerous councils and committees. He also has been a member of the Chicago Medical Society since 1987, serving as its president from 2013 through 2014.

## 1989

**Patricia L. Andrade** RES'95, a general surgeon with a special interest in breast surgery and laparoscopic surgery, joined the medical staff at Morton Hospital and Morton Surgical Associates in Taunton, MA.

## 1992

**Mai Khanh Tran**, a pediatrician in Fountain Valley, CA, is running for the Democratic nomination to challenge US Rep. Ed Royce next year. In news reports she has said she was motivated to run by Royce's support of the Republican health care plan. The first-time candidate has practiced in Orange County for 25 years and says most of her patients come from working-class migrant families.

## 1995

**Renu Sharaf Mansukhani** '91 and her daughters Natasha and Serena published a children's book, *Fred and Fiona: Fuzzy Blue Monsters with Finicky Fur.* Renu writes: "We created twin fuzzy blue monster characters together and made up stories about them while I was falling asleep while reading bedtime stories. It was a way to keep me awake." Renu is an endocrinologist at the National Center for Weight and Wellness, where she focuses on obesity medicine and helping patients with weight management. She lives in Arlington, VA.

**OPENING CELEBRATION: Divya Dethier MD'17 kicks off her graduation weekend.**

> "We created twin fuzzy blue monster characters together and made up stories about them."

**OPENING CELEBRATION: From left to right, Jeffrey Mazique, MD '74, Nia McGregor, Darius McGregor, Deborah Archer '95 MD'02, Shane McGregor '95, and Jeffrey Hines '83 MD'86.**

## 1996

**Julie Taitsman**, JD '92 is the chief medical officer for the Office of In-

SCOTT LAPHAM (2)

spector General for the US Department of Health and Human Services. She founded OIG's Quality of Care Workgroup and leads its physician education initiatives to prevent fraud, waste, and abuse. She previously served as senior counsel in the Industry Guidance Branch of the Office of Counsel to the Inspector General and has practiced health care law.

## 1998

**Myechia Minter-Jordan**, MBA '94 (see *Brown Medicine*, Spring 2016) received a Doctor of Public Service honorary degree at Northeastern University's 115th commencement for her leadership of The Dimock Center, which, the university says, she transformed "into a national model for health and human services." She joined the center as chief medical officer in 2007 and became president and CEO in 2013.

## 1999

**John Um** '95 is the surgical director of Heart Transplantation and Mechanical Circulatory Support at the University of Nebraska Medical Center and an assistant professor in the division of Cardiothoracic Surgery. His subspecialty is heart transplantation; last year, he garnered news coverage when he successfully completed three transplants in 34 hours. He and his wife live in Omaha with their three children.

> John Um garnered news coverage when he successfully completed three heart transplants in 34 hours last year.

**SAUBER LECTURE: Steven Rasmussen '74 MMS'77 MD'77, P'13MD'17 was this year's Ruth Sauber Distinguished Alumni Lecturer.**

MADELINE JOHNS

## 2000

**Michelle Quiogue** '96 was elected president of the California Academy of Family Physicians. A partner at the Family Medicine Department of Kaiser Permanente Kern County, she has held numerous leadership roles at CAFP, the American Academy of Family Physicians, and other professional organizations. She and her husband, Jason Sperber '98, live in Bakersfield, CA, and have two daughters.

## 2001

**Amit Joshi** '97 was appointed vice chair for academic affairs in the Department of Surgery at Einstein Healthcare Network in Philadelphia. Amit has been at Einstein since 2010, and has served as residency program director since 2013. He is an associate professor of surgery at the Sidney Kimmel College of Thomas Jefferson University. A general surgeon with an interest in laparoscopic herniorrhaphy, he and his wife, **Nikki Ariaratnam** '00 MD'04, a radiologist, live in Moorestown, NJ, with their two children, Layla and Vikram.

## 2003

**Emily Conway** '99 joined Sutter Health in Santa Rosa, CA, as a cardiologist. She previously practiced at the Adventist Heart Institute.

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**COMMENCEMENT: Called to begin his residency at Madigan Army Medical Center in Tacoma, WA, Peter Fredericks '73 MD'78 was unable to attend his medical school graduation from Brown. After 25 years of service in the Army Medical Corps and a long career as a diagnostic radiologist, he formally received his diploma in May.**

## 2010

**Peter Chai** '06 MMS'07 RES'14 was named one of Medtech Boston's 40 Under 40 Healthcare Innovators. He was recognized for his work on technologies, particularly wearables, that can help patients improve their health.

## 2013

**Ravi D'Cruz** RES'16 F'19 received a Rhode Island Hospital Teaching Award. Of the many subspecialty fellows in the Department of Pediatrics, Ravi was the sole recipient of the honor from the pediatric residents at Hasbro Children's Hospital.

## 2015

**Ella Anne Damiano** was married April 22 to Joshua J. Elliott at Sunny Slope Farm in Alton, NH. Ella is an obstetrics-gynecology resident at Dartmouth-Hitchcock Hospital. She and Joshua, who is pursuing a PhD at the Thayer School of Engineering at Dartmouth, met in 2014 in Rhode Island.

## 2006

**Adisa Jones** F'13 joined the medical staff of Sanford Health in Fargo, ND. Certified in critical care and internal medicine, he completed his fellowship in critical care at the Warren Alpert Medical School.

## 2009

**Steven Rougas** RES'13 F'14, an assistant professor of emergency medicine and of medical science at the Warren Alpert Medical School, is the new director of the Doctoring Program. A member of the faculty since 2014, he is an attending at The Miriam Hospital and Rhode Island Hospital. This year he was elected a Faculty Marshal and received a Profiles in Competence Award from the MD Class of 2017.

**COMMENCEMENT: Sara Clemens MD'17 listens to one last lecture.**

DAVID DELPOIO (2)

# ALUMNI ALBUM

## 2016

**Unikora Yang** '12 and **Justin Glavis-Bloom** '07 were married in Brooklyn in June. Both are second-year pediatrics residents at Children's Hospital Los Angeles.

## RESIDENTS

## 1990

**John Lonks**, MD F'92, an associate professor of medicine and of medical science at the Warren Alpert Medical School, was named the 2017 Charles C.J. Carpenter, MD, Outstanding Physician of the Year at The Miriam Hospital. An infectious disease specialist, he completed his residency and an infectious disease fellowship at Brown. John was named a Top Doc by *Rhode Island Monthly* magazine this year.

**COMMENCEMENT: Danly Omil-Lima '13 MD'17 photobombs Jamila Wynter MD'17 and Shamard Charles MD'17.**

**COMMENCEMENT: Vladimir Suric MD'17 had a little help accepting his diploma.**

DAVID DELPOIO (2)

## 1993

**Elizabeth Thyrum**, PhD, is the director of the Millersville University (PA) University Honors College. The assistant chair and an associate professor of psychology, she has been with MU since 1994. She completed a clinical psychology internship at Brown and a postdoctoral fellowship in the Division of Medical Psychology at Duke University Medical Center.

## 1998

**Ilse Jenouri**, MD, MBA, a clinical associate professor of emergency medicine at the Warren Alpert Medical School, became medical director of the emergency department at The Miriam Hospital in July. She had served as the associate medical director of the ED for the previous six years and has been on the staff of The Miriam since 2002.

**Elaine C. Jones**, MD F'99 received the Kenneth M. Viste, Jr., MD Patient Advocate of the Year Award at the 2017 annual conference of the American Academy of Neurology. Elaine is a neurologist with Specialists On Call Inc., a provider of telemedicine services and technology to acute care hospitals. She completed her neurology residency and a fellowship in neurophysiology at Brown. Formerly in private practice in Bristol, RI, she's been named one of *Rhode Island Monthly*'s Top Doctors five times and has served as president of the Rhode Island Medical Society.

**Jamsheed Vakharia**, MD, a clinical assistant professor of surgery at the Warren Alpert Medical School, received the 2017 Riesman Family Excellence in Teaching Award at The Miriam Hospital. Jamsheed, a general surgeon, specializes in minimally invasive laparoscopic surgery.

**REUNION DINNER: Lloyd Minor '79 MD'82, P'16, dean of the Stanford University School of Medicine, came back East for his 35th reunion.**

**REUNION DINNER: Jimmy Rotenberg '09 MD'13, Steven Emancipator '74 MD'77, Andrew Ruthberg '74 MD'77, and Judy Emancipator.**

**REUNION DINNER: Angelo DiBiasio, Heather DiBiasio MD'02, and Saori Murakami '98 MD'02 reconnect.**

SCOTT LAPHAM (3)

# ALUMNI ALBUM

**COOKE LECTURE: Joshua Schiffman '96 MD'00 discussed his work to create a treatment derived from a gene that stops elephants from getting cancer for the Charles O. Cooke, MD, Distinguished Visiting Lecture.**

Sarita Warrier was named assistant dean for medical education at Brown.

**COMMENCEMENT: Christine Cohen MD'17 lines up with her daughter.**

## 2002

**Gary Epstein-Lubow**, MD F'03 became the medical director of Hebrew SeniorLife's center of excellence for Alzheimer's disease and memory care in September. He also assisted with the planning for the National Research Summit on Care, Services and Supports for Persons with Dementia and their Caregivers, which took place in October at the NIH in Bethesda, MD. Gary is associate professor of psychiatry and human behavior and of medical science at the Warren Alpert Medical School; staff psychiatrist in geriatrics at Butler Hospital; and a member of the US Department of Health and Human Services' Advisory Council on Alzheimer's Research, Care, and Services.

## 2008

**Sarita Warrier**, MD, an assistant professor of medicine and of medical science at the Warren Alpert Medical School, began a new appointment as assistant dean for medical education in September. Her duties include assisting in students' successful transition to clinical clerkships and residency training and working with the other assistant deans who oversee the curriculum. She also is maintaining her clinical practice at Rhode Island Hospital, where she is an attending physician in the Division of General Internal Medicine.

## 2010

**Aarti Campo**, MD F'13 joined The Heart Center in Poughkeepsie, NY, in June. Previously she was a non-invasive cardiologist for PinnacleHealth Cardiovascular Institute and director of the heart failure program at PinnacleHealth Hospital in Harrisburg, PA. She completed her residency in internal medicine and fellowship in cardiovascular disease at Brown.

MADELINE JOHNS; DAVID DELPOIO

Lauren Hedde and Mark Turshen are co-owners of Direct Doctors in North Kingstown, RI.

## 2013

**Elizabeth Goldberg**, MD ScM'17, assistant professor of emergency medicine at the Warren Alpert Medical School and an emergency physician at Rhode Island and The Miriam hospitals, was honored by *Providence Business News* as one of the city's 40 Under Forty for 2017. She earned her master's in epidemiology from the Brown School of Public Health and was a postdoctoral research fellow in its Center for Gerontology and Healthcare Research.

**Stephen Hendriksen**, MD '04 and Sara Emmenecker '04 AM'11 announce the Feb. 17 birth of Emmett Kai Hendriksen in Minneapolis.

## 2014

**Lauren Hedde**, DO, and **Mark Turshen**, MD RES'15 are co-owners of Direct Doc-

DAVID DELPOIO

**COMMENCEMENT: Left to right, back row, Dan Friedlander MD'17, Ojas Mainkar MD'17, Mangala Patil '13 MD'17; front row, David Booy '13 MD'17, Norin Ansari '12 MPH'14 MD'17, Tina Sankhla '13 MD'17, and Gérica Alvarado '13 MD'17 cut loose.**

# ALUMNI ALBUM

tors in North Kingstown, RI. They say their practice, which they opened in 2014, offers full access to primary care for a monthly subscription, rather than insurance. Lauren and Mark completed their family medicine residencies at Memorial Hospital of Rhode Island.

**Patrick Sullivan**, MD, an assistant professor of emergency medicine, clinician educator, at the Warren Alpert Medical School, was appointed the associate medical director for emergency medicine at The Miriam Hospital. Previously he was the lead physician for the Clinical Decision Unit at the Anderson Emergency Center at Rhode Island Hospital.

## 2015

**Mark Turshen**, MD. See **Lauren Hedde**, DO RES'14.

## 2019

**Dominic Decker**, MD, MS, an internal medicine resident at Brown, won the *in-House* Readers' Choice Award in the online magazine's writing contest. He earned his master's in narrative medicine at Columbia and his MD at the University of Minnesota.

# FELLOWS

## 2009

**Kenneth Chen**, MD, received the Department of Medicine's Beckwith Family Award for Outstanding Teaching at the Warren Alpert Medical School. He is the director of the Division of Obstetric and Consultative Medicine and codirector of the Integrated Program for High-Risk Pregnancy at Women & Infants Hospital. He completed a fellowship in obstetric and consultative medicine at Brown. His primary interests include diabetes, obesity, and endocrine disorders in pregnancy.

## 2010

**Sonali Pandya**, MD, a breast surgeon at the Breast Health Center at Women & Infants Hospital and clinical instructor in surgery and in obstetrics and gynecology at the Warren Alpert Medical School, received the Unsung Heroine Award from Powerful Independent Notoriously Knowledgeable (PINK) Women in May. Sonali is helping to develop support programs for young women who have survived breast cancer. She also helps with breast exam training for the residency programs at Memorial Hospital of Rhode Island and with the voluntary staff on evaluating and managing breast masses and breast density.

> Sonali Pandya received the Unsung Heroine Award from Powerful Independent Notoriously Knowledgeable Women.

## 2012

**Michael Hokenson**, MD, was appointed medical director of the neonatal intensive care unit at Children's Hospital of Wisconsin-Fox Valley. A neonatologist and pediatrician who completed his fellowship training in neonatology at Women & Infants Hospital, he oversees the Level III, 22-bed NICU. Previously he was an attending neonatologist in the NICU at Elliot Health System in New Hampshire.

# OBITUARIES

## ALUMNI

### DONYA A. POWERS '80 MD'83 RES'86

**Donya A. Powers**, 59, of Providence, died May 19. She spent her entire professional career serving the needs of patients in the greater Providence region through her family medicine practice. Born in Wilkinsburg, PA, Dr. Powers graduated from Dover-Sherborn High School in Dover, MA, and was accepted into Brown's Program in Liberal Medical Education. After completing her family medicine residency at Brown, she began a solo practice offering full-spectrum family medicine, including hospital care and delivering babies. Her hospital appointments included terms as chair of family practice and medical staff president at Sturdy Memorial Hospital in Attleboro, MA. She also served as a part-time medical director for Hospice of CVNA in Attleboro.

Dr. Powers was a clinical associate professor of family medicine at the Warren Alpert Medical School and the recipient of numerous teaching awards. She served on the AAFP's Commission on Science, helping to develop official clinical recommendations and guidelines, as well as planning national continuing medical education programs for family physicians. She presented original clinical research at the AAFP World Family Medicine meetings in many countries, and volunteered with the AAFP Foundation's Physicians with Heart program in Tajikistan, Kyrgyzstan, and Georgia, delivering humanitarian aid and leading educational sessions for local family physicians.

A long-time resident of the East Side, Dr. Powers loved travel, photography, cooking, ballroom dancing, and reading mystery and science fiction

stories. She was devoted to her two Boston terriers, Steed and Emma Peel. She is survived by her brother, Michael R. Powers, PhD P'15MD'19; her sister-in-law; her two nephews, including Andrew Y. Powers '15 MD'19; and many friends in the Brown University and greater Providence communities. Donations in her memory may be made to the American Academy of Family Physicians Foundation, 11400 Tomahawk Creek Parkway, Suite 440, Leawood, KS 66211-2672.

### DANIEL MOORE JR., MD '49

**Daniel Moore Jr.**, 92, of Providence, died June 25. He grew up on a large farm in Coventry, RI, and attended Bryant College for one year before joining the Army Air Corps as an aviation cadet when he turned 18. During World War II he served as a navigator aboard a B-17 and flew 35 missions over Europe. He was awarded the Distinguished Flying Cross. After the war, he graduated from Brown and Tufts Medical School, then completed his medical residency at Rhode Island Hospital, as well as a cardiology fellowship at Rhode Island Hospital and a fellowship from the National Heart Institute.

Dr. Moore served on the medical and cardiology staffs of Rhode Island Hospital and was in private practice for more than 40 years, retiring in 1998. He also served as a staff physician at Butler Hospital and at St. Elizabeth's Home, where he was medical director and chief of staff from 1978 until his retirement. He was a member and past president of the Providence Medical Association and the Rhode Island Society of Internal Medicine. He also was a clinical instructor at the Warren Alpert Medical School and a staff member of the Andrews Infirmary at Brown.

He leaves his wife of 61 years, Nancy (McKenna) Moore '50; five children; and 14 grandchildren. Donations in his memory may be made to St. Sebastian Church in Providence or the American Heart Association.

## FACULTY

### ROBERT EMMETT CURRAN JR., MD

**Robert E. Curran Jr.**, 76, of Seekonk, MA, died May 2. He graduated cum laude from the College of the Holy Cross in Worcester, MA, and from Cornell Medical College, where he was inducted into the Alpha Omega Alpha Academic Honor Society in his third year. He completed residencies at Cornell/New York Hospital Medical Center; the National Cancer Institute at the National Institutes of Health; and the Wilmer Eye Institute at Johns Hopkins. He completed a fellowship at Boston Children's Hospital.

Dr. Curran had a private ophthalmology practice in Pawtucket for 42 years. He served as the chief of the Division of Ophthalmology at Memorial Hospital of Rhode Island from 1977 to 2013. He was also clinical assistant professor of surgery (ophthalmology) at the Warren Alpert Medical School for nearly 40 years, where he was awarded multiple distinctions for teaching at the Eye Clinic at Rhode Island Hospital. He published 16 papers on topics ranging from internal medicine to pediatric ophthalmology.

He is survived by his wife, Margaretta "Peggy" Cox Curran; three children; and two grandchildren. Donations in his memory may be made to the Comprehensive Cancer Center at The Miriam Hospital, 164 Summit Ave., Providence, RI 02906.

### BENJAMIN JACKSON, MD

**Benjamin Jackson**, 88, of Weston, MA, died June 28. Born and raised in Jacksonville, FL, he graduated from Duke University and Duke Medical School. While at Duke he met and married his true love, Alda Jean Davis; they were married for 46 years.

Dr. Jackson served as a captain in the Army. An intense intellectual, he pursued research, concentrating in physiology and endocrinology, and published many peer-reviewed studies. He was a dedicated surgeon and served as chief of surgery at the Providence VA Medical Center for 18 years, until he retired in 1998. He was a professor emeritus of surgery at the Warren Alpert Medical School. He was a passionate professor and mentor to residents and medical students.

Dr. Jackson was a wine connoisseur, gourmet chef, lover of the opera and the ballet, and an avid traveler; destinations included Australia, New Zealand, Tasmania, Mauritius, and many locales in mainland Europe and Scandinavia. He also cruised to Antarctica, Alaska, and through the Northwest Passage. Most of all, he was a loving husband, father, and grandfather who had no greater pleasure than spending time with his loved ones. He is survived by four children and five grandchildren. Donations in his memory may be made to the American Heart Association.

**Benjamin Jackson, MD**

COURTESY JACKSON FAMILY

# IMPRESSION

# Hakim's Triad

**In creating this piece for the Cerebrospinal Fluid (CSF) Disorders Symposium Exhibit this summer, artist Victoria Guerina explored patients' experiences with symptoms of CSF disorders in interviews, video blogs, and medical reports in order to understand what a person with normal pressure hydrocephalus might experience. Hakim's triad is a constellation of symptoms that affects the patient's ability to walk and causes urinary incontinence and memory loss. In this paper cast, a falling figure, two small spots of paper, and the absence of color relate to these particular symptoms. *Hakim's Triad* is one of Guerina's two submissions that were selected as the first-prize winners in the exhibit, which was cosponsored by the Warren Alpert Medical School, Art League Rhode Island, and The CSF Foundation in conjunction with the Second Annual CSF Symposium held at Brown in June. —*Kris Cambra***

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Shane Fischbach ’15 MD’19 and Solomon Swartz ’15 MD’19 developed a video series depicting patient interactions to help fellow medical students understand the real-world implications of their basic science courses. The project was part of their scholarly concentration in medical education, an independent learning opportunity supported by the Brown Medical Annual Fund.

# TODAY’S STUDENTS/ TOMORROW’S DOCTORS

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BROWN TOGETHER