VOLUME 1 | NUMBER 3 | FALL 2019

MEDICINE@BROWN

It's time to break the mold.

Redesigning Research Models p20

***OCEAN SURF*, BY BRIAN KIMBLE, MD**
NEWPORT, RHODE ISLAND, 2019
I captured this image of ocean surf against a rocky coastline along Ocean Drive in Newport. While Rhode Island is known for its coastlines, Ocean Drive is particularly scenic; its curving roadway hugs the shore, with just jagged rocks separating you from the water. I used a long exposure to create a dreamy and ethereal image. Rather than capturing the power of individual waves in sharp detail, this image is a more abstract interpretation of the beauty inherent in the location.

Kimble is a clinical associate professor of medicine and pulmonary/critical care physician at the Providence VA Medical Center.

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PHOTOGRAPH BY JAMIE CHUNG

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Growing Up and Out

In this issue of *Medicine@Brown*, you'll read about a new center that is developing tools that could become alternatives to animal testing in research. Brown is poised to become a leader in this growing field, which could potentially change the way toxicology testing is done. The Center to Advance Predictive Biology is just one of many new and growing research centers in the Division of Biology and Medicine.

In fact, our external research funding has grown impressively over recent years. As of the close of the fiscal year that ended in June, Biomed research had increased by 109 percent since 2013! This is due to both the recruitment of stellar new researchers who brought prodigious research portfolios with them as well as the increased productivity and success of existing faculty. As a result, we are one of the fastest-growing research medical schools in the United States. We are growing so quickly that we are running out of wet lab and office space. One of our present challenges is to figure out how to increase the space available for research in order to sustain this exciting trajectory.

There's more good news related to training the next generation of researchers. The Warren Alpert Physician-Scientist MD/PhD and Advanced Training Program has launched, reestablishing an MD/PhD program at Brown after a short hiatus. Thanks to the generous support of The Warren Alpert Foundation, we will be able to offset MD/PhD students' medical school tuition for all four years of their training. A robust MD/PhD program is an essential element of a successful, disease-focused medical school that trains future thought leaders. As such, it has been a priority to reestablish this program with a focus on translational science.

As you can see, our investments in people, resources, and education are paying off. We are grateful for the donors whose generosity has made this possible and for the hard work of our faculty, students, and staff.

—JACK A. ELIAS, MD
Senior Vice President for Health Affairs
Dean of Medicine and Biological Sciences

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VITALS

What's new in the classrooms, on the wards, and in the labs

Consistency Is Key

Daily routines may be unexciting, but when it comes to exercise, turns out boring is best.

In a study of 375 adults who have successfully maintained weight loss and who do moderate- to vigorous-intensity workouts, most reported that they exercised at the same time of day, most often in the early morning.

And regardless of what time people exercised, the *Obesity* study found that working out at a regular time was associated with higher physical activity levels.

"Our findings warrant future experimental research to determine whether promoting consistency in the time of day that planned and structured physical activity is performed can help individuals achieve and sustain higher levels of physical activity," says senior author Dale Bond, PhD, professor of psychiatry and human behavior (research). continued on p06

ILLUSTRATION: GETTY IMAGES

continued from p05

The Department of Health and Human Services' exercise guidelines for adults advise a minimum of 150 minutes of moderate-intensity aerobic activity or 75 minutes of vigorous activity each week to see "substantial health benefits."

The study subjects were all participants in the National Weight Control Registry. The registry tracks adults who have lost more than 30 pounds and maintained it for more than one year to help researchers identify the practices that help people lose weight and keep it off.

Leah Schumacher RES'19, PhD, the paper's first author and a postdoctoral fellow in the Clinical Psychology Training Program, says in the future they're hoping to study "whether there is a specific time of day that is more advantageous for individuals who have initial low physical activity levels to develop a physical activity habit." **—KRIS CAMBRA**

Conversations with Friends

PLMEs create a podcast to explore the art of medicine.

Timothy Flanigan, MD, vividly recalls the first time he went to a prison to treat incarcerated patients.

"Those doors clanging shut, and dealing with the security and correctional officers is not easy," says Flanigan, a professor of medicine and of health services, policy, and practice. "But it was overall a really wonderful experience, because when you're taking care of somebody and you shake their hand and look them in the eye and say, 'How are you doing? What's going on?' ... That interaction is really the same within jail or prison as it is outside."

One of his patients at a Massachusetts state prison, Robert, remembers just as clearly the first time they met.

"I'm sure I had an orange jumpsuit on, and I was shackled and handcuffed with a police escort, like a hardened criminal,"

OVERHEARD

"After dozens of RCTs and more than a decade since the initial clarion call to move to short-course therapy, it is time to adapt clinical practice for diseases that have been studied and adopt the mantra 'shorter is better.'"

—LOUIS B. RICE, MD, Joukowsky Family Professor of Medicine and chair of the Department of Medicine, in an *Annals of Internal Medicine* editorial calling on physicians to shorten the course of antibiotic treatment for pneumonia patients.

PHOTOGRAPHY: JORDAN EMONT MD'20

Alexander Homer, left, and Viknesh Kasthuri record in a studio at the Rockefeller Library.

says Robert, whom Flanigan, an infectious disease physician, treated for HIV and hepatitis C. But "right away he showed me respect, and right away I gave him respect."

This exchange takes place in the season one finale of *Back of the Chart*, a podcast launched in February by Viknesh Kasthuri '21 MD'25 and Alexander Homer '21 MD'25, both students in the Program in Liberal Medical Education. The podcast aims to give fellow pre-meds a deeper understanding of medicine, but it's deliberately light on jargon, and defines terms and diseases like HIV so any listener can understand.

By documenting conversations between physicians and their patients, Kasthuri and Homer explore the art of medicine beyond their coursework. The "human connection" inspired them to become doctors in the first place, Kasthuri says: "The story is the fundamental building block of medicine."

The podcast's title comes from Kasthuri's experience shadowing a cardiologist in rural Washington. The much-loved doctor asked each of his 2,000 patients about their hobbies, recent vacations, or grandchildren. When Kasthuri asked how he remembered so many details, the doctor flipped over his medical chart, revealing notes scribbled during each patient visit.

PLME's Whole Patient program features dinners where physicians and patients share stories with students, which helped inspire *Back of the Chart*. Homer and Kasthuri learned medical podcasting in a preclinical elective taught by Gita Pensa, MD, associate professor of emergency medicine, clinician educator, and Julie Roth '99 MD'04 RES'05 F'09, associate professor of neurology and of medical science, both podcast hosts themselves.

After finding a physician to appear on their show, Homer and Kasthuri ask them, "Which patient reminds you of why you want to get up every day and practice medicine?" The doctor usually selects "somebody who they have a great relationship with and who's likely to open up," Homer says. They conduct pre-interviews, go over the basic story with the interviewees, and help guide the conversation during recording.

The students usually don't know their guests beforehand, but by the end of the taping, "It feels like we've known them a lot longer," Homer says. It takes hours of transcription and editing to whittle 90 minutes of audio down to about 20. They splice in brief commentary and musical interludes, but the interviews really set the scene.

The show has gained a solid following, and the pair plans to launch Season 2 later this academic year. Homer says that even if nobody listened, he'd consider it a success thanks to "the personal growth it has given the two of us, being able to talk to doctors from so many different specialties and their patients." The experience, he adds, "has not been matched by shadowing."

—AMANDA M. GROSVENOR

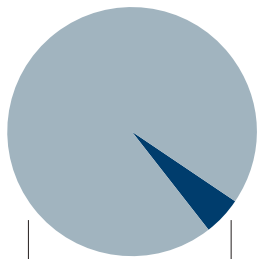
www.backofthechart.weebly.com

BY THE NUMBERS

Meet the MD Class of 2023

6,397 total applications

144 total students



307 applications to Primary Care-Population Medicine combined MD-ScM program

16 admitted

ROUTES OF ADMISSION:

AMCAS (standard route)	**76**
Program in Liberal Medical Education	**59**
Postbaccalaureate	**5**
Early Identification Program	**4**

♂ **68** | ♀ **76**

23 average age (range 20-34)

STUDENTS HAIL FROM:

Colleges and universities	**56**
US states and territories	**32**
Countries (birth or citizenship)	**17**

ASK THE EXPERT: LEONARD MERMEL

What would it mean for the US to lose its measles elimination status?

Measles was declared eliminated in the US in 2000, after the country went a full year without a reported case. But it could lose that status if the current outbreak, which began in October 2018, continues into this month. Leonard Mermel, DO, ScM, professor of medicine and the medical director of the Department of Epidemiology and Infection Control at Rhode Island Hospital, talks about what that would mean for him as an infectious disease physician and for the US.

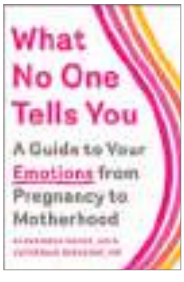
It's a sad testament to our national public health endeavor. If the rates of transmission of a vaccine-preventable illness are going up in a developed country, it suggests we lack resources and the political will to reduce the risk of transmission in public settings. The percent of the budget for public health has gone down for several decades. The public health infrastructure may be less able to deal with emerging infections than it could years ago.

Overall, the rate of new measles cases fell over the summer; the question is what will happen when kids go back to school, when so many viral infections are transmitted in crowded school settings. People should be able to send their children to school and not have to worry about them getting measles. Such safety can be assured if those kids are up to date with their measles vaccinations.

At Rhode Island Hospital, we prepare for Ebola and all sorts of things. But one of my biggest concerns is measles. Day to day, there is a risk of someone coming into our emergency department with measles symptoms that may not be immediately recognized. I've only seen one measles case that I'm aware of in my life. Most US-trained physicians today have never seen a case. The initial symptoms when it's still transmissible before the rash occurs—bad, cold-like symptoms, the red, runny eyes—may not tip someone off right away. We need to remain very vigilant.

BOOKSHELF

THE 'BLISS MYTH'



What No One Tells You: A Guide to Your Emotions from Pregnancy to Motherhood
BY ALEXANDRA SACKS, MD, AND CATHERINE BIRNDORF, MD
Simon & Schuster

Getting pregnant is sudden and life changing—and for many women (many more than we're led to believe), it's not all for the good.

Birndorf MD'95 and Sacks are psychiatrists in New York who care for pregnant and new mothers. If there's one belief they want to dispel for both patients and readers, it's the "bliss myth": that motherhood equals joy. This expectation of happiness, they argue, "is not only unrealistic, it's dangerous."

Explaining the complex psychology and hormones that affect pregnant women and new moms could easily become dense and unwieldy. But the authors keep the tone light and the pace quick, with patient anecdotes, bulleted lists, and how-to boxes, to guide readers through unexpected challenges like loss of identity; guilt for a range of choices related to work, breastfeeding, and more; and medical complications, miscarriage, and postpartum depression.

Through it all they reassure readers: you are not alone. Writing about the dramatic and sometimes humiliating changes that happen in the third trimester, Birndorf and Sacks get to the heart of why they wrote their book: "We believe if women started sharing rather than keeping secrets about their bodies during pregnancy, it could normalize (and revolutionize) an experience that's been viewed as a source of embarrassment or shame."

—PHOEBE HALL

ILLUSTRATION: LARA TOMLIN

Isn't She *Lovely*?

Study reveals gender and minority bias in clerkship evaluation language.

What's in a name? What's in an adjective? Can seemingly innocuous descriptors in a third-year clerkship evaluation shape a medical student's future?

Signs point to yes, according to a study co-authored by Rebekah Gardner, MD, associate professor of medicine, and published in May in the *Journal of General Internal Medicine*.

The work began on a hunch, after Gardner, who chairs the internal medicine residency selection committee, and Urmimala Sarkar, MD, MPH, a professor at the University of California, San Francisco School of Medicine, compared observations about med student evaluations.

"Both of us had noticed quite a difference between [dean's] letters that were describing female versus male medical students," says Gardner, who each year reads 50 to 100 of these letters, also called Medical Student Performance Evaluations (MSPEs). "It's really striking when you start to notice it."

The conversation sparked a research project that analyzed almost 90,000 third-year core clinical rotation clerkship evaluations from UCSF and Brown. The authors examined descriptions of underrepresented minorities (URMs) in addition to women. Computer algorithms sifted through the text and picked out common adjectives, weighting them for importance based on how often they were applied.

The study found that women were more frequently labeled with personality traits like "lovely," "cheerful," and "fabulous," while male counterparts received descriptors for competency-related behaviors, like "scientific." URMs, meanwhile, were often described as "pleasant," "open," and "nice," and less likely than non-URM students to be called "knowledgeable."

Gardner, who also teaches medical students during their third-year clerkships, knows that clerkship evaluators frequently write the same students' residency recommendation letters, referring back to clerkship evaluations for reminders—sometimes verbatim. "So you may see echoes of the same verbiage," Gardner says. Because MSPEs are an important part of residency applications, language can create a ripple effect: residency opportunities impact future fellowship chances, and so on.

"What seems like a really tiny thing can have reverberations moving forward through that person's career, particularly if [they] are already coming from a disadvantaged background," Gardner says.

Though the study results weren't unexpected, Gardner says what surprised her more, "but wasn't totally surprising, was the URM data. That's been less looked at before." And, she adds, they were "certainly very problematic."

Gardner notes that implicit or unconscious bias can occur when writing evaluations, especially when they are so numerous and frequent that they become routine. Reviewers become "less intentional" about word choice, she says, "and less thoughtful about the implications of those words." Reviewers often lead hurried, busy lives, "so you shortcut. And when our brains take shortcuts, that doesn't serve disadvantaged groups very well."

Brown and its residency programs regularly offer training for faculty and hospital staff to address unconscious bias, and Gardner's department is participating in a University of Wisconsin workshop initiative called the Bias Reduction in Internal Medicine program.

Gardner plans further study of effective bias reduction. "I think it would be helpful to have more data-driven approaches as opposed to just sort of using intuitive approaches," she says. "It's an area that we need more work on." **—AMG**

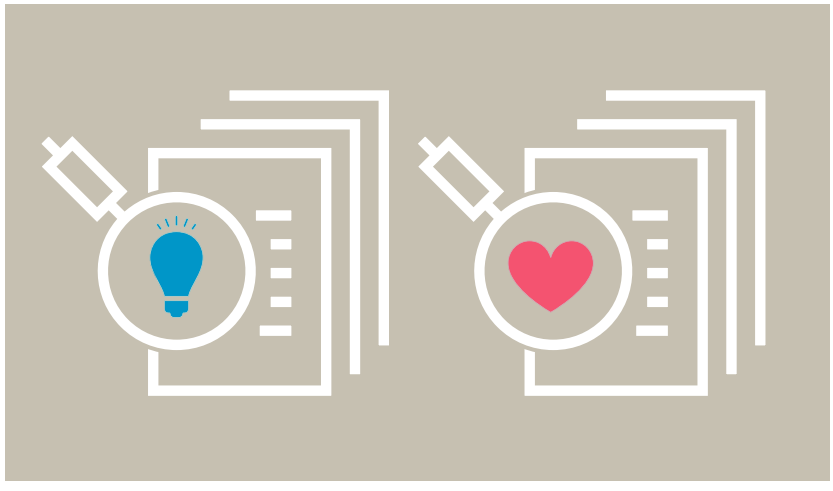


ILLUSTRATION: 2COMMUNIQUÉ

COOL TOOL

Remote Access

Telehealth can improve access to care in the most isolated places—an obvious need in huge, sparsely populated Western states, but even in Rhode Island not everyone can get to the doctor easily.

"Everyone thinks everyone has access to a vehicle, and they don't," says Tracey Guthrie RES'99, MD, the director of the General Psychiatry Residency Program at Butler Hospital and an associate professor of psychiatry and human behavior. When, in addition to a car, you need a boat or a plane to see your physician, access really becomes problematic.

Until eight years ago any resident of Block Island—which lies about 13 miles off Rhode Island's southern coast—who needed psychiatric care had to take a full day and multiple modes of transportation to get it. Then Brown's psychiatry residency program launched a telepsychiatry service, a secure, two-way video link that connects a resident at Butler with adult patients on the island.

"I've been a patient of the program from its beginning," says Patrick Tengwall, 63, who had been trekking to Barrington, RI, once a month to get his psychiatric medicines refilled. Compared to in-person appointments, he says, "it's not that much different. … The relationship you develop with the doctor, I'd say, is more important than the medium by which you're talking to the doctor."

The telepsychiatry room in the Block Island Medical Center is cozy, with comfortable chairs and a couch. "It is like being in a counselor's office," Tengwall says. One major difference is the large computer monitor with two-way cameras. The other is the presence of the case manager, Tracy Fredericks.

Fredericks has been facilitating the program from the island since its inception. She's there to connect the patient and physician, fix technical issues, schedule appointments, and fill out paperwork. Also, "I'm part of the [patient's] support group," she says. "They know I'm on the island and they know they can call me whenever."

There's a shortage of psychiatrists nationwide, particularly those who treat kids. Jeffrey Hunt, MD, the director of the Child and Adolescent Psychiatry Fellowship Program, is working to duplicate the telepsych service for his trainees. "Communities have developed workarounds. Most of the time, it's the primary care docs who have had to figure out how to manage [adolescents]," says Hunt, a professor of psychiatry and human behavior.

With telehealth, one specialist can see more patients in more places, he adds. "It's a more efficient way of treating people." **—PH**

Carbon dioxide snow treatment set, ca. 1930, from the Rhode Island Medical Society Collection donated to the John Hay Library.

FROM THE COLLECTIONS

COLD CASE

The first recorded instance of skin cancer comes from 1600 BCE in an ancient Egyptian text called the Edwin Smith Papyrus. The cancer was treated using cauterization with a tool called the "fire drill."

In our quest for cancer-free skin, modern-day humans have tried equally inventive tools. But perhaps one of the most important is carbon dioxide: not the gas, but the solid.

In 1907, a physician named William A. Pusey began using CO_2 to help treat skin cancer. In the first known use of cryotherapy, he was able to freeze off epithelial skin cancer nodes by applying solid carbon dioxide snow. A few years later, the practice became widespread to get rid of lesions, warts, and more. Solid CO_2 was even popular for things like tumors on the bladder.

In the 1950s, practitioners shifted from carbon dioxide to liquid nitrogen, which is now standard practice in cryotherapy. Physicians also use it to deliver low temperatures in a variety of dermatologic procedures like cryopreservation. **—ANEEQAH NAEEM '20 MD'24**

PHOTOGRAPHY: ERIK GOULD

IN VIVO

LIFE'S A CLIMB

Climbing has been a family affair for Susan Ramsey RES'97, PhD, and Stephen Scott RES'98, MD, since their children were small. When their son, Liam, was diagnosed with type 1 diabetes at age 7, "we doubled down on the adventure," says Ramsey, an associate professor of psychiatry and human behavior and of medicine (research), because staying active was so important for his health. Scott, a clinical assistant professor of medicine and an internist with Brown Medicine, felt unprepared for the realities of living with the disease. In medical school "you learn the nuts and bolts," he says, "but the day-to-day minutiae, I had no clue." It's not only demanding, it's "isolating," Ramsey adds; just 4.1 percent of Americans with diabetes have type 1. To bring families together while sharing their love of climbing, the couple founded Rock Type 1, which organizes indoor climbing events across New England and, once a year, an outing in the White Mountains. "We hear all the time, I met someone [with type 1] who lives in our town," Ramsey says of their events. "It's an invisible disease," Scott adds. "You look at the parents of type 1s, and it's this look of understanding, that you get what they're going through." —PH

BRAVE HEARTS
Diabetes can be scary, but climbing boosts kids' confidence. "There's something really empowering about facing that fear of heights," Ramsey says.

CLIMBING GUIDE
Grace, 19, roped her whole family into the sport when she was 7. Now a sophomore at Dartmouth, she helped lead Rock Type 1's White Mountains event this summer.

SURE FOOTED
A continuous glucose monitor helps Liam, 16, ensure he's stable before climbing. "This tool has really changed how we're able to plan and be safe," his dad says.

ROCK ON
Family vacations revolve around climbing and mountaineering, from Mount Rainier to the Alps. Liam "didn't have to change his goals in life because of his diagnosis," Ramsey says.

CONTINUING EDUCATION
"Realizing how all-encompassing [type 1 diabetes] was," Scott says, "changed how I treated [patients with] type 2. … I understand what they're going through."

PHOTOGRAPHY: PETER GUMASKAS

Silent No More

By speaking up for safety and equality, we can improve health care for all.

BY RESA E. LEWISS '92, MD, AND KATHERINE SHARKEY, MD, PHD

The summer between her junior and senior years at Brown, an aspiring pre-med student secured what she believed to be an amazing opportunity: a coveted summer internship with a hand surgeon in Washington, DC.

On the second floor of the Maddock Alumni Center, she had searched through the three-ring binders overflowing with opportunities. Finally, after concentrating on the academic and theoretical aspects of pursuing a career in medicine, she wanted the experiential: she could not wait to observe surgery in the operating room and to assist at office hours.

Then.

Day one. The surgeon put his arm around her in a way that instantly felt not quite right. By the second morning, before a full day of office hours, he forcefully tried to kiss her. And he tried again. And again.

Angered by her silence, as well as by her repeated rebuffs of his overtures, he yelled at her.

"Listen. You better get used to this. It's going to happen a lot to you in medicine."

Her male pre-med friend had completed the same summer internship one year prior and had raved about this surgeon and the experience. In contrast, she was left asking herself questions with answers that could significantly alter her future: Should I apply to medical school? Am I strong enough? Am I equipped to navigate this? Should I expect this from all men in medicine? Although there is nothing else I can see myself doing, should I become a doctor?

NOT AN ISOLATED CASE

Data about sexual harassment of women in medicine indicate that this young woman's experiences were not exceptional. In June 2018, the National Academies of Science, Engineering, and Medicine (NASEM) released a report detailing the high prevalence of sexual harassment directed toward women in these disciplines. Over more than 300 pages, the report outlined startling and sobering statistics: that more than half of women faculty—and nearly as many students—report harassment that ranges from gender-based discrimination to crude behaviors to unwanted sexual attention, sexual coercion, and assault. Thus, although the details are unique for each woman, the stories aren't really that different.

The NASEM report also described the host of negative consequences for women who experienced these forms of discriminatory behaviors. The adverse impacts are dire, and include deleterious effects on a woman's personal health, such as higher rates of depression and anxiety, and negative career and educational outcomes including decreased productivity, lower grades, relinquishing leadership positions, leaving the institution, and even leaving medicine or science altogether. Perhaps most disheartening was the finding that the least common response

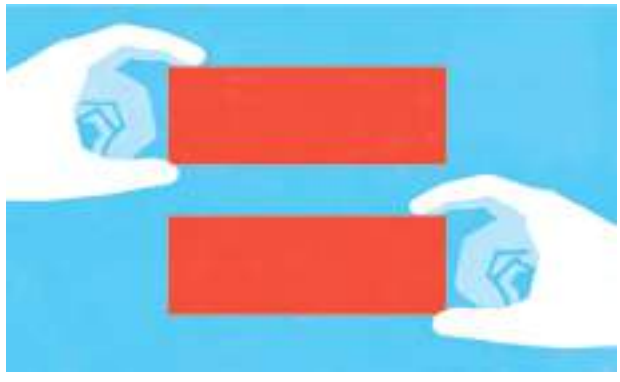


ILLUSTRATION: CHRIS GASH

to the experience of sexual harassment was for the woman to report it formally. Fears of retaliation, not being believed, and other negative personal and professional consequences are often cited as the reasons that women don't report. Equally disturbing is the observation that the best predictor of continued gender-based discrimination and harassment is the perception that the institutional culture tolerates these behaviors.

So there's the problem. Women are afraid to report. Without reporting, corrective actions are unlikely or impossible. Without corrective actions, the institutional culture does not reject harassment, and the behaviors are perpetuated. Nothing changes.

What does this mean for the field and for patients? Here the data are clear: patient care suffers when gender equity is not a priority.

Diverse clinical and research teams are more innovative, productive, effective, and creative. Breakthroughs like sequencing the human genome, development of antiretroviral medications, and creation of the HPV vaccine resulted from multidisciplinary teams representing many perspectives and encompassing broad expertise. Situations that lead women in medicine and biomedical sciences to not pursue their career passions or to leave the workforce ultimately have the consequence that talented, competent, creative, and diverse minds are not contributing to patient care.

TIME'S UP

So what's the answer? It is time to raise the standards of acceptable behavior in the work and educational environments of medicine and biomedical sciences.

On March 1, TIME'S UP Healthcare, an initiative of the Time's Up Foundation, a 501(c)(3), held its national launch in New York City at the New York Academy of Medicine. As a part of this launch, we and a few other members solicited schools, hospitals, and institutions to join as founding signatories.

Signatory institutions are health professional schools and institutions, such as large health systems and practices that employ at least 100 health care workers. This threshold was established to ensure that signatories have the capacity with the infrastructure support to effect meaningful change.

Founding signatories joined in advance of the TIME'S UP Healthcare launch. Eight medical schools, hospitals, and institutions stepped forward and committed. The Warren Alpert Medical School was one of them. Brown is proud to be a founding signatory institution. They were among the first to sign and make public a commitment to three tenets:

1. Sexual harassment and gender-based discrimination have no place in the health care workplace. We are committed to preventing sexual harassment and discrimination, and protecting and aiding those who are subject to harassment and discrimination.

2. We believe women should have equitable opportunity, support, and compensation.

3. We will measure and track sexual and gender harassment and inequity occurring within our institution.

Since the original eight institutions joined, 34 more have become signatories, including the Lifespan health care system, which includes several Brown-affiliated teaching hospitals. TIME'S UP Healthcare has set a goal of enrolling 100 signatories by 2020.

Based on the NASEM findings, sexual harassment occurs at all academic medical centers. These behaviors have not been eradicated for many reasons, including underreporting, lack of awareness, and insufficient resources for addressing gender-based mistreatment. TIME'S UP Healthcare has called attention to the reality that all medical workplaces are struggling in some respect when it comes to addressing these problems. We are here to align with and support organizational efforts to achieve equity and safety and to create a strong and inclusive workforce that can provide the best possible care to its patient population.

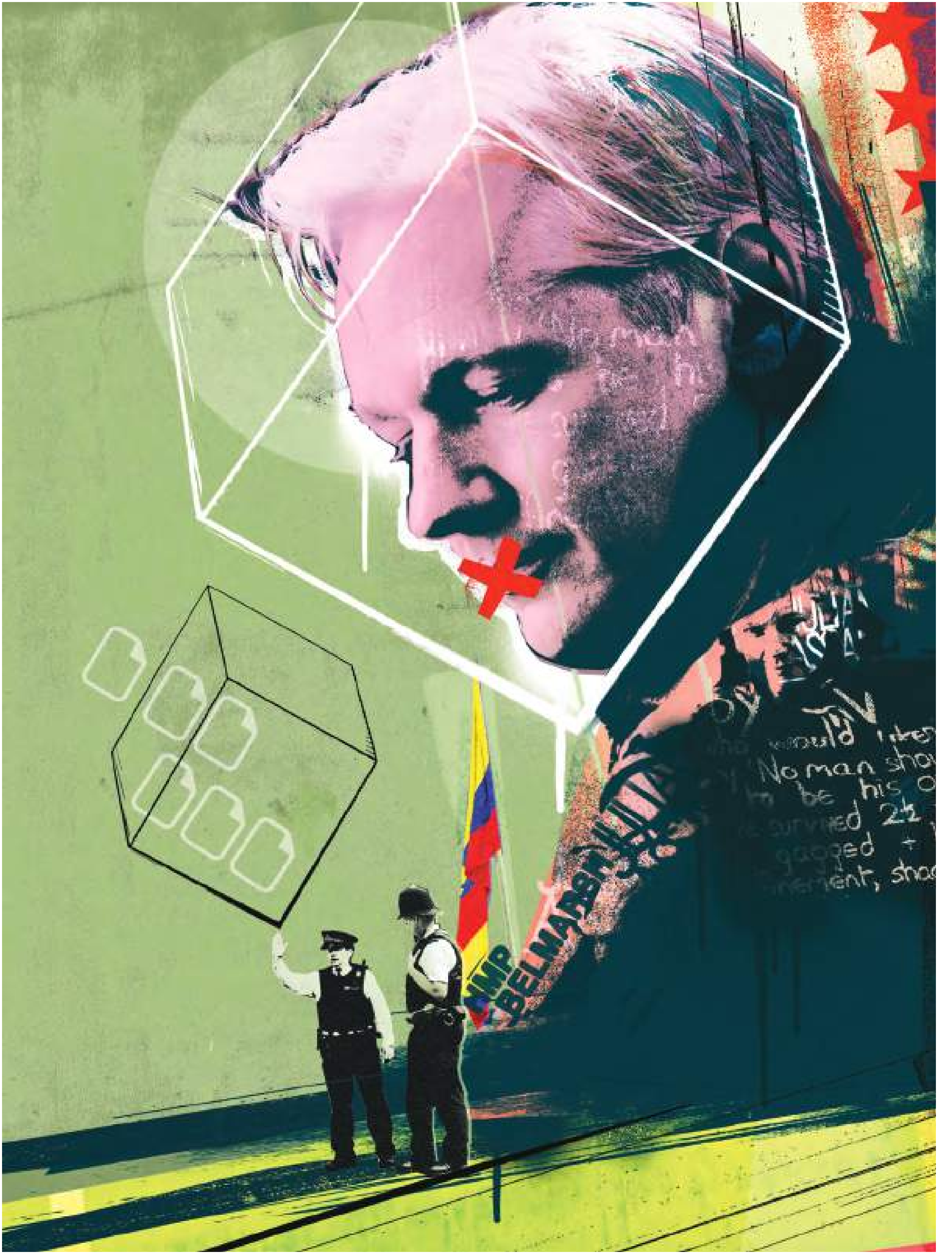
So what happened to the Brown pre-medical student when she returned for the fall semester of her senior year? She reported the experience to the alumni office. The summer internship was immediately removed from the listings. With the encouragement of faculty mentors, she completed applications to medical school and pursued a career in medicine.

Not all women do.

It's time to stop gender-based discrimination and harassment in health care.

RESA E. LEWISS is a professor of emergency medicine at Thomas Jefferson University. She is a founding member of TIME'S UP Healthcare. **KATHERINE SHARKEY** is associate professor of medicine and of psychiatry and human behavior and assistant dean for Women in Medicine and Science at the Warren Alpert Medical School.

Information about how to report sexual- or gender-based discrimination, harassment, and assault at Brown is available at brown.edu/about/administration/title-ix/get-help, and policies and procedures for medical students are available at brown.edu/academics/medical/student-mistreatment-policies-and-reporting-procedures. For immediate help, members of the Brown community can also call the Sexual Assault Response Line at 401-863-6000.Visit timesuphealthcare.org/donate to support TIME'S UP Healthcare.


HMP BELMARSH

BY KRIS CAMBRA | ILLUSTRATION BY TIM MARRS

‘Courage Is Contagious’

Hero or villain? No matter their opinion of Julian Assange, all doctors should agree he deserves medical care, argues Sean Love MD’17. In a wide-ranging interview, the human rights advocate talks about health care for asylum seekers, challenging biases, and his meeting with the controversial founder of WikiLeaks.

IN MAY 2017, a week before graduating from the Warren Alpert Medical School, Sean Love MD'17 met with WikiLeaks founder Julian Assange in the Embassy of Ecuador in London to propose that he undergo a series of objective forensic medical and psychological evaluations.

Two years and dozens of hours of evaluations later, the UN Special Rapporteur on Torture was so moved by the teams' findings that he proclaimed, "Mr. Assange has been deliberately exposed, for a period of several years, to progressively severe forms of cruel, inhuman or degrading treatment or punishment, the cumulative effects of which can only be described as psychological torture."

Now, one of the senior evaluators on the team, whom Love recruited to the project, has been asked to testify in Assange's case against extradition to the US, where he faces charges under the 1917 Espionage Act—carrying the maximum penalty of life in prison—for his work publishing classified information related to the US wars in Iraq and Afghanistan. Meanwhile, Love, a combined anesthesiology resident and adult critical care medicine fellow at Johns Hopkins, continues to advocate for Assange's health. Through his work, Love seeks to remind us and the international community that, regardless of our personal or political opinions, everyone is entitled to their fundamental human rights, including the rights to privacy and access to health care, under international law.

Medicine@Brown asked Love to share how and why he became involved in Assange's case, and how his experiences at Brown affected his development as an advocate for human rights.

How did you become interested in this subject?

As an undergraduate at the University of North Carolina, I studied political science and international affairs. The wars in Iraq and Afghanistan dominated discussions at the time. I also worked for a veterans' advocacy group in Washington, DC, that helped bring public attention to the signature injuries of the wars: traumatic brain injury, post-traumatic stress disorder, and soldier suicide. We lobbied Congress to improve care and reduce extended deployments. Through the experience, I learned about the conduct and consequences of war, and I began to contemplate a career caring and advocating for those wounded by conflict.

Like most other Americans, I first heard about Julian Assange and his alleged source, Chelsea Manning, in 2010, when WikiLeaks released the Iraq and Afghan War Logs. I followed the debates that ensued, such as those over US war crimes, whistleblowing, and freedom of the press.

Later, in my first year of medical school, I helped establish the Brown Human Rights Asylum Clinic, a student-run, faculty-mentored clinic that provides forensic medical evaluations of survivors of torture seeking asylum in the US. We worked with the NGO Physicians for Human Rights to build local capacity. Together we hosted trainings and various seminars to teach medical students and faculty from around New England how to conduct physical and psychological evaluations of asylum seekers following the Istanbul Protocol, a set of guidelines for documentation of torture and its consequences developed by the UN. It was the nexus of these experiences that led me to organize the evaluations of Julian Assange at the Ecuadorean embassy.

There are millions of asylees in the world and no shortage of human rights causes worth defending. Why Assange?

There are indeed many asylees and there are even more refugees. With the European refugee crisis and ongoing immigration issues at the US southern border, the public is increasingly aware of issues pertaining to asylum. Originally I thought I would write about Assange's experience as an asylee as a way to bring attention to the field of asylee health in general. This, however, proved unfeasible as I learned quickly how unique Assange's situation was, as well as how highly politicized he had become in the wake of the 2016 US presidential election. I encountered a number of people early on, including medical professionals and academics, who felt strongly that Assange was not deserving of his status as an asylee. After some reflection, I found that my goal in taking on the project was this: to remind the medical community that

> "Assange was living in circumstances similar to solitary confinement."

human rights apply equally to everyone, most especially those we may disagree with politically. Those persecuted on account of race, religion, nationality, political opinion, or belonging to a particular social group are most vulnerable. We have to remember, the whole purpose of the international human rights system is to defend such people, and I wanted to call attention to this.

Take us through Assange's legal situation to date.

Assange was a political asylee of the state of Ecuador from 2012 to the time of his arrest in April 2019. From 2010 to 2012, Assange was living in the UK under house arrest, fighting an extradition case to Sweden, where he faced questioning over sexual abuse allegations. When the UK courts ordered Assange to be extradited to Sweden in the summer of 2012, he sought refuge in the Ecuadorean embassy. Assange subsequently applied for political asylum in Ecuador on the grounds that, if extradited to Sweden, he would be onward-extradited to the US, where he would face persecution and undue punishment on account of his publishing activities. After extensive review of the rationale and justification for his application, Ecuador granted Assange asylum under international law. However, UK authorities refused safe passage for Assange to Ecuador, stating that they would arrest him (under any circumstances) as soon as he left the embassy. This led to a stalemate under international law: Ecuador declared Assange an asylee persecuted on account of his political beliefs and publication activities, while the UK declared him a fugitive.

Seeking to rectify the legal situation, in 2015, the UN intervened and undertook an extensive review of his case. After hearing arguments from both sides, the UN ruled that his situation within the embassy amounted to an "arbitrary detention" and called on the UK to grant Assange safe passage to Ecuador, where he could enjoy the full rights of his asylum. The UK refused. Subsequently, Ecuador applied for Assange to be granted humanitarian safe passage to a hospital, where he could be diagnosed and treated for several ailments. This was also refused by UK authorities.

What is Assange's situation now?

Assange is in Belmarsh Prison in southeast London, having been forcibly removed from the embassy by British police after Ecuadorean officials renounced his asylum and citizenship in April.

In 2001 and 2002, Belmarsh was used to detain a number of people indefinitely without charge, leading the international press to draw comparisons between it and the detention camp at Guantanamo Bay. Today, the prison holds domestic and foreign nationals charged with terrorism-related offenses, murder, and other crimes. On May 1, the UK courts sentenced Assange to 50 weeks for skipping bail when he sought asylum in the Ecuadorean embassy. That same day, the US government unsealed an indictment against Assange related to the leaks provided by Chelsea Manning. On May 23, the US further charged Assange with violating the Espionage Act, reminiscent of the Pentagon Papers case from the Vietnam War era. This is the first time a publisher (and not a source) has been charged for releasing classified information. Barring diplomatic intervention, Assange will likely serve a 50-week term in Belmarsh. In June, Sweden rescinded its extradition request, indicating that they will send their prosecutors to London to question him there, something Assange's lawyers have argued for since his house arrest in 2010. Lastly, his hearing for extradition to the US is scheduled for February 2020.

PHOTOGRAPHY: MARK CHEW

With whom did you work on this project?

Members of Brown's faculty, including Dr. Josiah Rich, helped connect me with experts willing to take on a case of this magnitude. Eventually I recruited two people: Dr. Brock Chisholm, a British psychologist and expert in PTSD who has served in several high-profile cases in UK and international courts, including a case litigating against torture at CIA-run "black sites"; and Dr. Sondra Crosby, an internal medicine physician and associate professor of health law, ethics, and human rights at the Boston University School of Public Health. Crosby served as director of the Boston Center for Refugee Health and Human Rights, where she examined over 300 torture victims, and was one of the first doctors allowed to independently examine Guantanamo Bay detainees. Starting in the fall of 2017, Drs. Chisholm and Crosby began conducting independent evaluations of Assange at the Ecuadorean embassy. Working in parallel, they painstakingly examined and documented Assange's condition, clinical status, treatment, and physical and mental deterioration under extremely challenging and, as we have argued, inhumane circumstances.

What were your impressions of Assange's situation on meeting him for the first time? What was the embassy like?

I first met with Assange in a small conference room within the Ecuadorean embassy on May 19, 2017, about an hour after he last appeared in public from the balcony of the embassy, where he had addressed a large crowd of reporters on the street outside. During our conversation, white noise emanated from a stereo to interfere with listening devices, Assange explained. The embassy was a tense and uneasy space, located on the first floor of an old apartment building, where it had been converted to a couple of small, cramped offices. Its windows looked out onto a two-lane street, but for security reasons, heavy curtains were drawn at all times. During the day, consular activities took place there. In the back, Assange had a small room with a cot and shared a bathroom with embassy staff. He had no meaningful access to the outdoors, and had to rely on others for food and clothes. I found it almost inconceivable that he had been living there, surviving, for almost five years.

What did the evaluations find?

Much of this information is protected by doctor-patient confidentiality. What I can say is that Assange is resilient, but his suffering and the psychological toll of his circumstances were apparent. Compounding these injuries was that, for nearly seven years, Assange had been unable to receive proper medical care. Within the embassy, he had difficulty obtaining treatment, as most physicians refused to visit him for fear of associating themselves or their medical practice with him, his political views, or his publishing activities. Meanwhile, UK authorities predicated his access to a hospital on his arrest. If he suffered a medical emergency, such as a stroke or heart attack, would he stay in the embassy and risk going without treatment for a potentially life-threatening issue? Or would he be forced to relinquish his asylum by seeking care in a hospital? To a person who was granted asylum in part due to threats against his life from various governments, this presented an impossible situation. Yet this was one of the questions Assange and his staff had to grapple with throughout his nearly seven years in the embassy. Adding to this, several new restrictions were implemented starting in March 2018 when, at the direction of a newly elected president, Ecuador severed Assange's internet access and severely restricted his rights to receive visitors at the embassy. From then until his arrest in April, Assange was living in circumstances similar to solitary confinement.

Describe your efforts to defend Assange's human rights.

As clinicians, it is our ethical duty to advocate for the health and human rights of all people as promised under international law, and to call on our colleagues to hold our professional societies, institutions, and governments accountable. Based on Crosby and

"Human rights apply equally to everyone, most especially those we may disagree with politically."

Sean Love

Chisholm's findings, we felt compelled to advocate for Assange's health—and to draw a clear distinction between advocacy for his health and political support for him or his work. We published an editorial in *The Guardian* in January 2018 calling attention to the health effects of his detention. In June 2018, I published a follow-up piece in the *British Medical Journal*, in which I called on the international community, and in particular the Australian government, to defend his right to access health care. In February, Crosby conducted her final evaluation of Assange in the embassy. She then wrote to the Office of the High Commissioner for Human Rights at the UN. Based on her observations, the UN appointed its Special Rapporteur on Torture, Nils Melzer, to look further into Assange's condition. In May, Melzer led a UN delegation and took independent medical evaluators with him to visit Assange in Belmarsh. Based on this meeting, Melzer validated Crosby's findings, calling Assange's treatment at the hands of the UK over the past seven years "torture." Crosby will visit Assange at Belmarsh later this year to continue the evaluations, and she will testify in his extradition hearing in February. In the meantime, I remain involved in his case through communicating with human rights organizations and amplifying issues pertinent to his health on Twitter (@SeanLoveMD) and in the news media. In April, I discussed Assange's health in a 20-minute TV interview on Telesur.

Where do you see things going from here?

Assange's situation is too fluid and complex to predict. In 2012, when Assange was asked how long he thought he would have to stay in the embassy, he replied "perhaps a few months." What I do know is I will continue to defend Assange's rights under international law, including his right to access health care. Last spring Assange was in the medical ward at Belmarsh, receiving treatment for ailments that were either caused or severely exacerbated by his detention within the embassy. I remain concerned that if Assange is extradited to the US, he may face treatment similar to that of Chelsea Manning, who for years was, according to the UN, subject to "cruel and inhumane treatment" while being held in solitary confinement.

What difficulties or obstacles have you encountered in the course of this work?

Defending the human rights of a controversial figure has been challenging. For a time, Assange was considered a "hero" by some following the disclosures of the Iraq and Afghan War Logs. This changed in 2016, when WikiLeaks released the Podesta/DNC emails; some liberals came to view him as a villain while some conservatives, including President Trump, praised him. Meanwhile, Sweden continues to investigate allegations of sexual misconduct dating from 2010. The evolving public opinions of Assange have created an exceedingly difficult, if not at times toxic environment within which to defend his human rights. Our team has been approached by hecklers, harassed on social media, and at times viewed with suspicion by colleagues in academia.

More importantly, organizations such as Human Rights Watch, Amnesty International, and Physicians for Human Rights, which are typically at the vanguard of calling attention to human rights violations and mistreatment of persons because of their political beliefs, have been at times hesitant and even reluctant to speak out. This is true even in the context of the UN Working Group on Arbitrary Detention having called for Assange's release as well as recent statements by UN Special Rapporteur on Torture Nils Melzer. I believe, among other things, this has much to do with the personal and political biases of individuals working in the human rights field. As professionals, we aspire to be objective and impartial in our analyses. Yet we are only human. As Melzer admitted publicly, he was initially reluctant to take on Assange's case due to his being "prejudiced" by the prevailing political climate and what he had been reading in the news media. To understand the human rights aspects of Assange's case, we must look beyond what a politically polarized media would have us believe. Instead we have to examine critically the circumstances of the situation with respect to what individuals are entitled to under international law: namely, to be free of cruel, inhuman, and degrading treatment and torture. When asked about my own biases, I echo the words of Dr. Crosby in sworn testimony, "Yes, I am biased against torture. And you should be, too."

What advice do you have for Warren Alpert medical students based on your experience?

I think it is paramount to recognize the unique perspective that a medical education, especially one from Brown, lends to working on issues pertinent to social justice and human rights. Of course, we also have to be willing to leverage this perspective to take action, and to do so often requires courage. There are some who will say that defending human rights against political headwinds can negatively impact one's career. However, to accept this is to undermine one of the crucial roles that physicians play in society: advocating for their patients, no matter how unpopular, repressed, or persecuted they may be. I might have been among the first people to call attention to this particular issue, but I found quickly that courage is contagious. **M@B**

BY PHOEBE HALL | PHOTO ILLUSTRATION BY JAMIE CHUNG

Alternative Model

The newest lab rats aren't rats. Scientists are growing microscopic human tissues and challenging the need for animal testing.

FROM THE MOMENT YOU WAKE UP, you encounter hundreds of chemicals that have never been tested for safety. The shampoo and shaving cream and makeup you apply every day, the plastic water bottle you sip from, the detergent you use to wash your clothes and dishes, the fabric protector on your sofa: many—even those labeled "natural" or "organic"—are teeming with compounds whose safety for human use has never been proved. And that's just before you leave the house.

Our lives are awash in chemicals—more than 80,000 of them, from the clothes we wear to the food we eat to the air we breathe. The Toxic Substances Control Act, passed in 1976, was intended to regulate the safety of chemicals in commercial products. But the law grandfathered in roughly 60,000 chemicals already in use and, despite an update giving the EPA more authority in 2016, to date only about 700 chemicals have been tested under the law. Meanwhile, about 3,000 new ones come on the market annually.

"There's so many chemicals that are released into the world every year, and we have studied such a small number of them. And we only seem to study them after the fact, when we have some sort of evidence that there's a problem," Donna McGraw Weiss '89, JD, a Brown University trustee, says.

That's because testing these tens of thousands of chemicals is time-consuming and expensive work. Toxicity assessments must be done on animals, often rodents, and every chemical must be tested many, many times, at multiple concentrations, before decisions can be made. Even then the data may be flawed; humans aren't 150-pound rats. It can cost millions of dollars, many years, and hundreds of animals' lives to complete toxicity testing on a single substance—a significant investment if the findings are correct, a potentially tragic one if they're wrong.

Weiss, who studied biochemistry at Brown and began her career in a molecular biology lab, says there are other, better ways to test chemicals and protect ourselves from harm, and they're being developed at her alma mater. She and her husband, Jason Weiss, are so confident in the know-how at Brown that they've committed millions of dollars to support the research.

"If you have a quick, efficient, inexpensive, human cell model, you can pre-test many chemicals before they ever get out there," she says. "The impact of that is tremendous."

WILLING CONVERT

More than a decade ago, Kim Boekelheide, MD, PhD, a professor of pathology and laboratory medicine, was wrapping up a three-year stint on a National Academy of Sciences committee that examined chemical safety testing methods. An expert in toxicology testing, he says "animal testing had been what I had done my entire life." But he came to see the flaws in this traditional methodology.

The committee brought together experts in the field from around the world to ask how they could do better science and better protect the public. "I got converted in the process of serving on that committee," Boekelheide says. In 2007 they published their findings in the report *Toxicity Testing in the 21st Century: A Vision and a Strategy*. It transformed the way his field thinks about testing on animals, he says.

"We need to move away from animals into an *in vitro* testing approach to achieve the goal of high-throughput toxicity testing for safety assessment," which would allow thousands of compounds to be tested quickly, Boekelheide says. "I became a

"We're really just standing back and letting the biology do its thing."

PHOTOGRAPHY: GETTY IMAGES

proselytizer: 'we've got to do this.'" He returned to campus determined to find a collaborator in this new venture.

Meanwhile Jason Weiss was looking for ways to support research on alternatives to animal testing. A former vice chair of the board of directors for the Humane Society of the United States, he contacted the organization's chief scientific officer at the time, who knew Boekelheide. Weiss was thrilled an opportunity might be found at Brown.

Donna Weiss, however, was skeptical. As a researcher at Rockefeller University, she had worked on mouse models. She'd had "moral qualms" about it, she says, but nonetheless, like Boekelheide, "I had always thought that that was how research was done." Now a private equity adviser and philanthropist, she's maintained a lifelong interest in scientific research and education. The more she talked to Boekelheide about the challenges facing toxicity testing and the need for faster, cheaper alternatives, "the more exciting I thought it was."

That's how the Weisses and Boekelheide wound up on the doorstep of Jeffrey Morgan, PhD, a professor of medical science in the Department of Molecular Pharmacology, Physiology, and Biotechnology and a professor of engineering. By then, Morgan had for years been perfecting new, better ways to conduct tests *in vitro*—literally, "in glass," like petri dishes. Morgan shared their concerns about the expense and unreliability of animal testing. But petri dishes are no substitute for *Homo sapiens*, either.

"The classic petri dish forces cells to stick to the dish, the plastic, and spread out, and they look like a fried egg," with the nucleus as the yolk, Morgan says. Cells in a two-dimensional layer can't reliably predict how our three-dimensional tissues will react to a chemical exposure.

So Morgan invented the 3D Petri Dish, a patented, three-dimensional cell culture mold that's used to produce microtissues: tiny clusters of cells that naturally aggregate and form structures like capillaries and ducts. They can do this because, Morgan says, the cells are nestled in the small microwells of a molded agarose gel, "like an egg carton." The gel is non-adhesive, so, with nothing else to stick to, the cells' surface adhesion molecules stick to each other, as they would in a living organism.

"They're now interacting with each other, forming a ball of cells, and they're doing it spontaneously," Morgan says. "And not only do they do that, they're now free to do morphogenesis"—a developmental process in which tissues acquire their functional shapes. "We're really just standing back and letting the biology do its thing," he says.

And does it ever. Within weeks, brain microtissues, grown from adult human stem cells, are producing electrical signals. Heart microtissues are beating. And each is composed of just one, two, or three types of cells.

But is that enough to decide whether a chemical is safe for human use? Morgan and Boekelheide are only at proof-of-concept stage, they say, so time will tell. But they're feeling good about their chances. "Everyone soberly acknowledges that this technology ... will only get you so far," Morgan says. "There won't be an entire human in there. But there will be some aspect of biology that's valuable, that's organ specific, that will be sufficient to make a decision."

"And that's all you need," Boekelheide says.

NEW BEGINNINGS

Well, you also need a lot of data. And analyzing all that data is the rate-limiting step, Donna Weiss says.

That's where she and her husband's interest in the project really got the ball rolling. Boekelheide and Morgan had recruited other faculty to work with them to refine the technology and demonstrate its utility. "It's been quite a journey. We started out on a shoestring," Boekelheide says. Then the Weisses came forward with several major gifts.

> "There won't be an entire human in there. But there will be some aspect of biology that's valuable, that will be sufficient to make a decision."

"That definitely catalyzed it," Morgan adds, by allowing the group to buy a high-throughput confocal microscope, the Opera Phenix, with which they can rapidly acquire high-quality, 3-D images of microtissues. He held up one of the bright green molds that researchers use to cast a 3D Petri Dish. Smaller than a fingertip, the plate forms 96 wells, each of which has four microwells. The cells, once added, naturally aggregate and form a spherical microtissue in each microwell. They're then treated with different chemicals at various concentrations.

"We go to the microscope," Morgan says, "we open the door, we put [the 3D Petri Dish] in there, close it, go to lunch. We come back, and now we have 17,000 images," serial sections of the 384 microtissues, dyed with different fluorescent colors. With the Opera Phenix's software, "we can assess the health or disease of those tissues based on their structure and function," he says.

In 2017, the group became an official campus entity: the Center to Advance Predictive Biology (CAPB). Morgan and Boekelheide partner effortlessly as director and associate director, respectively, joking about each other's hair (or lack thereof), bantering about biochemical engineering like it's last night's playoff game, and finishing each other's sentences.

The center's equally congenial members, most of them biologists, engineers, or doctors, meet regularly to share expertise and troubleshoot, and annually at a retreat for progress updates. The five teams are using microtissues to assess the effects of chemical exposures on brain, heart, lung, ovary, and prostate cells, and the Opera Phenix to gather the data. The next step is automating the process, so they can gather more data even faster. It's only with data—massive quantities of data—that they can prove the technology's viability as an alternative to animals in toxicity testing.

The microtissues are "being exposed across a concentration range to the 80,000 environmental chemicals ... to find out, what is the concentration of exposure that produces an adverse effect?" Boekelheide says. Though each microtissue may contain only a couple of human cell types—cardiomyocytes and cardiac fibroblasts in the heart models; pulmonary macrophages, epithelial cells, and fibroblasts in the lung—it may be enough to be predictive. "The goal is to develop a panel of cells ... to have confidence that you're covering the biologic response landscape in sufficient degree to make a call on safety," he says.

It's the simplicity and practicality of this approach that attracted Paul Carmichael, PhD, to the project. Carmichael, science leader and senior toxicologist at the Safety and Environmental Assurance Centre at Unilever in the UK, sits on the CAPB external advisory committee. His company, which makes and sells hundreds of consumer products around the world, has funded some of the center's research.

"You could create as an academic exercise ... the perfect *ex vivo* lung," Carmichael says. "But for toxicity testing, it might be that we don't need that. ... A chemical agent can have a toxicity because it perturbs a common aspect of the biology in that cell system or that organ tissue system." He continues, "We think we can be successful ... by having a number of key sentinel tissues with the higher biology provided by these sophisticated culture systems."

OF MICE AND MEN

Agnes Kane, MD, PhD, a professor of pathology and laboratory medicine, studies the health effects of asbestos fibers and engineered nanomaterials on the lung. She abandoned mouse research about a dozen years ago. "We were trying to cure mesothelioma, and we did cure mesothelioma in the mice, but we also killed them," Kane says. "I said, that's enough of this. I can't do this anymore. By then, I'd gone through thousands of mice, and there's got to be a smarter way to do this."

But when Boekelheide suggested she switch to microtissues, "I'd say, no, Kim, we can't do this, it's not going to reproduce any chronic pathology," Kane says. It took him six months to wear her down. "I finally said, I've got to give this a try." She laughs with delight, her eyes sparkling at the memory. "It started working, and I was just amazed."

Her lab's human lung microtissues are composed of macrophages, epithelial cells, and fibroblasts, which she chose to reproduce fibrosis, or collagen scar tissue. A lung has about 80 types of cells, and most pulmonary diseases arise from complex interactions between them. But disease produced by inhaling engineered nanomaterials, she says, "is due mostly to the interaction between

epithelial cells lining the airways; macrophages, which are supposed to clean up any particles that get inhaled into the lungs, and then the fibroblasts," which produce collagen.

It took three years of tinkering to get the microtissues to behave as they would in a human, to identify biomarkers that indicate fibrosis in response to asbestos or carbon nanotube exposure. Kane hopes that, if the technology works, her model might be used to prevent disease from new and existing nanomaterials. "Limit airborne exposure. The workers, make sure they're protected," she says. "There is a way to be more proactive about it." She says with improvements the lung microtissues could also be used to test new therapies.

Nonetheless, "it is a model," Kane says. "You have to be very, very careful in choosing the cells and choosing what you're trying to assess." Such "fit-for-purpose" models can be made, though they'll be technically challenging. Her group also wants to compare effects on microtissues made from female and male cells, as there are hormonally driven differences in lung diseases. And they haven't yet exposed the lung microtissues to chemicals.

The to-do list is long, but Kane finds it all exciting and worthwhile. The microtissue model "probably will be better than testing it in a mouse, and be more closely reflective of how humans would respond," she says. "We have to do this. Because we can't keep making more chemicals and keep using all of these chemicals." Furthermore, she adds, "sometimes we're exposed to several of these all at once. Now what's going to happen? There's no way you can predict this. You'd be using mice till there's no tomorrow."

SOME ASSEMBLY REQUIRED

Jess Sevetson PhD'21 had misgivings about working with animals before she joined the neuroscience graduate program. She wanted to study neural system regeneration, but to do that she'd "have to injure an animal and then watch it recover," she says. But then she learned about the lab of Diane Hoffman-Kim PhD'93, an associate professor of medical science and of engineering, who was using brain microtissues, which Sevetson now uses to study the effects of traumatic brain injury.

For the CAPB, Sevetson was part of Hoffman-Kim's team evaluating how the microscopic spheres of brain cells respond when exposed to domoic acid, a potent neurotoxin. Preliminary results were consistent with the real-life effect, though the team noted challenges like a lack of a blood-brain barrier as well as the sheer complexity of measuring neurological response. That's where Sevetson comes in, using calcium imaging to observe neuron activity.

PHOTOGRAPHY: GETTY IMAGES

"I've gotten good results in microtissues that are composed of about 8,000 cells," she says. "All it takes is a couple of weeks for the neurons to put out extensions and make synapses. … They're doing all the microscale processes that brains are doing." And that was using microtissues made with only a few types of cortical cells, which assemble somewhat randomly; despite that, "it works about the same way every time," Sevetson says.

As she's gotten more involved with microtissue research, Sevetson has been rethinking her postgraduate career. "It's pushing the boundaries. It's work with broader implications in a lot of different directions," she says. "I'd love to cure a disease—we all would—but I'd really love to make it easier and more efficient for other researchers to cure a lot of diseases."

Sevetson follows developments of other organ models out there, like organ-on-a-chip technology (microchips that use human cells to model organ function) and more complex organoids to study cancer or developmental diseases like autism. "I'm thinking about that for a postdoc," she says. "The whole field is advancing just so fast."

Sending trainees into the world with not only knowledge of microtissues but a new perspective on animal research is one of Donna Weiss's goals for the CAPB. "They'll go out to other institutions and bring that with them," she says. "It's really seeding a whole field. … It's really a way of us leading."

About 25 graduate and undergraduate students and postdocs work in the labs affiliated with the center, Boekelheide says. Molly Boutin PhD'16, who worked on brain microtissues in Hoffman-Kim's lab, is now on the 3-D Tissue Bioprinting Team at the NIH's National Center for Advancing Translational Sciences. "The impact is the people the center trains and where they go and what they carry with them," Morgan says.

HEARTS AND MINDS

Kareen Coulombe, PhD, an assistant professor of engineering and of molecular pharmacology, physiology, and biotechnology, is working on cardiac microtissues for the CAPB with Ulrike Mende, MD, professor of medicine, and Bum-Rak Choi, PhD, associate professor of medicine. Using tissues derived from female human induced pluripotent stem cells, which spontaneously beat ("We call them beaters," Coulombe says, describing how one pulsed so vigorously it popped out of the mold), the group has shown that bisphenol A (BPA) blocks ion channels, which can cause arrhythmia. It's unlikely they would have found that with animal tests. "Rodents are notoriously terrible models for predicting cardiac arrhythmias," she says.

> "It's pushing the boundaries. I'd really love to make it easier for other researchers to cure a lot of diseases."

But Coulombe does use rats in other research. She engineers myocardium from stem cells with the ultimate goal of transplanting it to people who've had a heart attack, to regenerate the injured heart. For now, though, she is using rats, sewing the macrotissues onto an organ about the size of your thumbnail.

"As an engineer, you always come up with a model that is as simple as possible to answer your question," she says. Furthermore, "every animal protocol requires you to justify the use of animals." Creating tissue that would re-engineer the contractility of the heart simply can't be done on a microscopic ball of cells.

No one in the CAPB is anti-animal testing. Most have done it, some still do; it's required to get a new drug approved, to get certain grants. "That is the status quo," Morgan says. "What we're trying to do is change the status quo. Do better science with alternatives." There are endless examples of animal tests failing to predict human response, from thalidomide 60 years ago to a potential Alzheimer's treatment that was scrapped last year, in the phase 2 clinical trial, due to liver toxicity. "They'd spent a bazillion dollars," Morgan says, "they had a stack of data, animal data … to go to humans, and it still failed."

The European Commission in 2013 banned testing cosmetics and their ingredients on animals, and selling such products anywhere in the EU. For that reason Paul Carmichael says Unilever's interest in non-animal testing technology "wasn't just all altruism. It's perfect business sense," he says. The market is a driver, too. While the public is comfortable with testing drugs on animals, "the opposite is often true of the cosmetics world and consumer products. People really are choosing those things that say 'not tested on animals,'" he says. "We have to go with that, while always assuring safety."

In September, the EPA commited to a phaseout of animal testing, simultaneously announcing elimination of its support for mammal studies by 2035 and funding for the development of alternative technologies. Compared to Europe, where several labs and private companies are working on new models, there are just a few in the US, such as the Wyss Institute at Harvard and Johns Hopkins' Center for Alternatives to Animal Testing. "We do really have the opportunity to be one of the premier institutions in this work," Donna Weiss says.

In her former life as a biomedical researcher, Weiss worked on the Human Genome Project, a joint endeavor among dozens of universities and labs around the world. "In order to develop this field of alternatives to animal models and using human cells for toxicity testing," she says, "you're going to need to have multiple facilities and centers that are really focused on this. … I'm about to see Brown being one of those core centers."

"It takes a village to do this kind of thing," agrees Les Reinlib, PhD, of the National Institute of Environmental Health Sciences. He's familiar with similar projects other NIH institutes are funding. "Even though different institutes are sponsoring different things, we should be able to bring it all back together and say, here's the entire cardiovascular system, plus the entire respiratory system, plus the entire lymphatic system," Reinlib says. "We'll be able to use what we want to in a much more in-depth way, much, much more similar to nature than in current tissue models."

AND THEN THERE WERE TWO

As an administrator and program director in the NIEHS's Exposure, Response, and Technology Branch, Reinlib helps oversee the $2.6 million, five-year Bioengineering Research Partnerships (BRP) grant that is funding much of the center's current work. He also sits on the CAPB Scientific Steering Committee and, in that role, will help decide next summer which two of the organ microtissue models will move forward. There's simply not enough money in the BRP for all five projects to generate the amount of data needed to present microtissues as a viable toxicity testing alternative to private companies as well as federal regulators.

"It's a shame, in a way, to have invested a lot of upfront efforts—and, by the way, your money—into a project like this, and then it's going to have to scoot around and try to find additional funding," Reinlib says, though he adds, "I'm confident in the long run they'll all be OK."

The researchers say they'll find new grants to continue their work in the center if their projects aren't among the chosen ones. By the end of the second year of the BRP, this summer, all had showed significant progress over year one and had papers published or in the works. "We're very collegial," Agnes Kane says. "I think we'll be able to make the decision. It's a little too early to tell yet. … Things can change pretty rapidly now because we've got most of the technology advanced to a critical point."

In the meantime Morgan and Boekelheide (who head up the ovary and prostate projects, respectively) have other plans for the center as it becomes a more established campus entity. They're hiring a new faculty director; they're working on a new, catchier name for the center; they're planning a campus seminar series.

And they'll keep pushing the technology, beyond the scope of the BRP grant: the Boekelheide and Morgan labs filed a provisional patent on a new coculture model in which an organ microtissue is surrounded by liver cells that would, theoretically, metabolize chemicals or drugs in a more lifelike way. They see center members eventually building more complex organoids or even whole organs—"the next frontier," Morgan calls it.

But first things first. "The onus is on these systems to be replacements," he says, "to demonstrate they work. So that's a very high bar."

"Although, on the animal side, there's never been an onus," Boekelheide adds, "because there wasn't an alternative. … They've gotten a pass, historically—"

"That we're not getting," Morgan puts in. "And we don't mind."

Boekelheide is fond of saying that when he wrapped up his service on the National Academy of Sciences panel, he predicted it would take 50 years to get where the field is now, just over a decade later. "There's been a huge, huge revolution in the way people are thinking," he says. And at Brown, "we have made such tremendous progress in the last three years. I mean, there was no center three years ago."

Donna Weiss hearkens back to the Human Genome Project. "It was years and tens of millions of dollars to sequence the first genome. And now, it's less than a day," she says. "That's been over the course of my working lifetime.

"So that's where I would love to see this go," she continues. "And if it does, it will have so many positive impacts on science and the world." **M@B**

PLAYING

New youth hockey rules draw on Brown research to reduce concussions.

BY AMY ANTHONY
PHOTOGRAPHY BY ALEX GAGNE

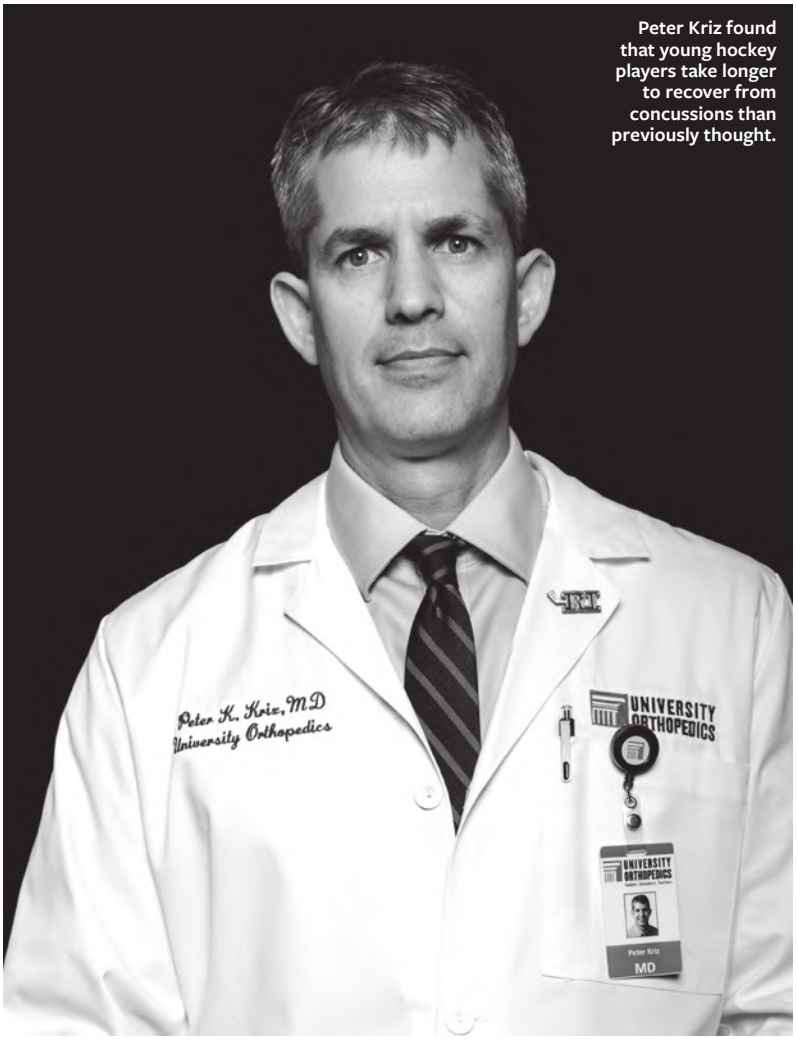
; IT SAFE

Griffin Crain, 13, left, and his brother Owen, 16, of Barrington, RI, have played hockey most of their lives. Neither has suffered a concussion.

PETER KRIZ, MD, was a general pediatrician in private practice in 2005 when he saw a patient who changed the trajectory of his career. As Kriz stood outside the exam room and read the high school hockey player's medical chart, he overheard the boy's father coaching him on how to pass a test that is administered to patients who suffer concussions; this concussion was the boy's third. "Think of it as a phone number" was the advice the father provided to recall the reverse digit spans used to assess concentration on the concussion assessment testing.

"I thought, 'This is crazy.' The most important thing to this father is trying to get his kid back into the game," Kriz says. "I realized that we needed more doctors trained in managing sports concussions and their effects."

Today, he's an associate professor of orthopaedics and of pediatrics, and an assistant team physician at Brown, where his research interests include injury prevention in youth sports and sport-related concussions. Kriz is particularly interested in studying what happens when youth and high school sports teams are organized by skill level rather than age, size, and physical maturity level, especially in ice hockey.



Peter Kriz found that young hockey players take longer to recover from concussions than previously thought.

SIZE MATTERS

That's how teams are formed in high school sports, so it's not uncommon for a highly skilled 14-year-old to participate alongside and play against an 18-year-old, particularly in ice hockey, according to Mike Lunney, assistant executive director of the Rhode Island Interscholastic League. The RIIL supervises and administers athletic programs for 60 public, private, and parochial high schools across Rhode Island.

After treating a high school freshman in 2011 for his second concussion—inflicted by an older player during a travel ice hockey game—Kriz grew troubled by the discrepancy between the players' size and physical maturity, combined with what he described as a culture among some youth ice hockey players of targeting and injuring younger players.

"I saw how one player's malicious play could have a lasting impact," he says.

Kriz collaborated with colleagues at Brown, Hasbro Children's Hospital, Boston Children's Hospital, and South Shore Hospital in South Weymouth, MA, on a study to examine the association between physical maturity and the risk of prolonged concussion symptoms. While the long-held belief in the medical community is that most pediatric concussions resolve in 28 days, Kriz and his colleagues hypothesized that younger players took more time to recover.

The study, published in the *Journal of Pediatrics* in 2016, evaluated 145 concussed male and female ice hockey players between the ages of 13 and 18. They found that male players who were less physically mature took about 55 days to recover, compared to about 30 days for their more physically mature counterparts. Ultimately, the researchers found that nearly half of pediatric concussions took longer than 28 days to heal.

"After three weeks, the child may no longer have headaches, so he'll return to school, and maybe even resume playing the sport. But other studies using advanced neuroimaging on children who sustained concussions found that after a month, many still had significant alterations in cerebral blood flow," Kriz says.

WALL OF SHAME

Kriz took his findings to the RIIL, where he was a member of the Sports Medicine Advisory Committee. The committee is responsible for bringing forward concerns related to players' safety.

The RIIL had been trying to eliminate "flagrant hits" from its ice hockey games, while maintaining the integrity of the game, Lunney says.

Armed with Kriz's research, coaches and other members of the RIIL worked together to create new statewide guidelines to discourage players from accumulating penalties for game misconduct, including flagrant penalties such as purposely targeting other players.

Under the new guidelines, any player who accumulates 50 or more penalty minutes in a regular season will be suspended for two league games, as well as any game in between. Players who accumulate 70 or more penalty minutes will be suspended for the remainder of the hockey season, including the playoffs.

Additionally, the Rhode Island Hockey Coaches Association (RIHCA), which works with the RIIL, now has what Kriz calls a "wall of shame," an area on the RIHCA website that lists the names, teams, and total penalty minutes of any player who has accrued more than 25 penalty minutes. This section, called "Penalty Watch," is included in the stats for every division.

"All of a sudden, they see themselves getting called out, and not in a good way," Lunney says.

Since implementing the new guidelines, the RIIL has seen a reduction in the number of penalties among its ice hockey players, he adds.

"The intent is not to reduce participation, but it's really under the players' control whether they hit that penalty threshold. The proof is in the results," Lunney says.

Meanwhile, Kriz collected the penalty data from the RIHCA, as well as injury data from local hospitals, to determine the effect of what he calls the penalty infraction minute (PIM) rule change. His study, published in the *American Journal of Sports Medicine* in February, found that the PIM rule change significantly reduced the number of all injuries, concussion/closed head injuries, and upper body injuries among high school ice hockey players who play in the RIIL.

GAME CHANGER

Kriz makes the case for PIM rule changes in not only ice hockey but in all youth collision sports as a way to mitigate injury risk without "fundamentally changing the sport," he says.

Kriz and Lunney both hope the rule change will eventually be implemented regionally before becoming a national rule.

An advocate of fair play in all sports, Kriz partnered with Dawn Comstock, PhD, an epidemiologist at the University of Colorado Denver to analyze the effectiveness of yellow card accumulation policies in US high school sports in reducing injury rates in boys' and girls' soccer. Rhode Island is one of 15 states to have such a policy in effect, initiated in the 2008-2009 season. Kriz and Comstock hope to present their findings at the Pediatric Research in Sports Medicine meeting in January 2020.

"I'm passionate about making sports safer without changing the fundamental aspects of the game," Kriz says. "Team sports, including contact/collision sports, afford kids so many great opportunities that will positively impact their lives, including promoting lifelong fitness. Let's not throw the baby out with the bathwater. Let's give rule changes and educational programs an opportunity to reduce the risk of injury in youth and high school sports." **M@B**

"TEAM SPORTS AFFORD KIDS SO MANY GREAT OPPORTUNITIES. LET'S NOT THROW THE BABY OUT WITH THE BATHWATER."

CHECK-UP

What's new with Brown medical alumni

To Boldly Go

Peter Lee '94 MD'05 PhD'15, MS, MPH, has had a stellar career—literally. A cardiothoracic surgeon and assistant professor of surgery with a joint appointment in biomedical engineering at The Ohio State University, Lee regularly receives research grants from NASA and serves with two national air and space organizations.

Lee's childhood passion for space has never diminished. While in the Program in Liberal Medical Education, he became interested in research through his neuroscience honors thesis, then spent his first medical school summer in the lab of Herman Vandenburgh, PhD, now professor emeritus of molecular pharmacology, physiology, and biotechnology and of pathology and laboratory medicine, who had flown experiments on the space shuttle. Lee applied to Brown's MD/PhD program; Vandenburgh became his pathobiology PhD adviser.

"Peter was one of the friendliest and best-liked students that I mentored," Vandenburgh says. "He encouraged others in the lab to work toward accomplishing their dreams, and was one of the major reasons that another student in my lab at the time, Jessica Meir, went on to become a NASA astronaut." In September, Meir '99, MS, PhD, went to space for the first time, to live and run experiments on the International Space Station.

Midway through medical school, Lee took a break to complete a one-year Master of Science in Space Studies at the International Space University in France, learning space law, medicine, and engineering, and conducting research in Russia during his winter trimester.

Planning to specialize in emergency medicine and aerospace medicine to become a NASA flight surgeon, Lee found himself unexpectedly loving his third-year surgical rotation. He decided to pursue surgery, he says, because "you can't just 'kind of' do surgery, but you can be involved in aerospace medicine and research on the side."

He integrated his love for space through national leadership service in the Aerospace Medical Association and the American Society of Gravitational Space Research. Before getting his own lab in 2013, he helped obtain two separate grants that flew aboard the ISS, studying how spaceflight affects fruit fly hearts and stem cell-derived heart cells. An upcoming study, funded by the NIH and NASA, will send tissue-engineered heart muscle to the ISS.

Perhaps Lee's most memorable research was his student experiment from Vandenburgh's lab that flew on John Glenn's space flight in 1998, which "was really exciting because of all the media coverage," Lee says. When Glenn came to Brown to receive an honorary degree the following year, "we had a two-hour sit-down with him."

He continues, "Ironically, I was here at OSU where John Glenn was living 10 minutes away, and I never had the opportunity to meet with him. Unfortunately, he passed away in 2016."

Born in Germany, Lee grew up in Montreal; he met his wife, Chaelyun, in Providence at a Korean church while she studied industrial design at RISD. They had their daughter, Elisa, now 11, while attending Harvard for graduate school: she for architecture, he for his MPH. A lieutenant colonel in the US Air National Guard, Lee recently completed Air Force flight surgeon training. He enjoys scuba diving and has his pilot's license and a 7th-degree black belt in taekwondo.

Becoming an astronaut after age 46 is unlikely, but Lee still hopes he might venture into space someday—maybe by "reaching out to Elon Musk," he jokes. He has "the best of both worlds," he adds: "I'm a flight surgeon with the Air Force, doing NASA space-related research that's directly related to the heart and cardiovascular system, while also saving lives performing heart surgery and transplants. What more can I ask for?"

—AMANDA M. GROSVENOR

PHOTOGRAPHY: JODI MILLER

The Ground Truth

A PATHOBIOLOGIST BUILDS AI TO IMPROVE DIAGNOSIS AND TREATMENT

Artificial intelligence works really well in applications that rely on visual data; it's how your iPhone recognizes your face. In pathology, each patient sample, with tens or hundreds of thousands of cells, is a rich data trove for training machine vision platforms.

This is the business of PathAI, founded in 2016 by pathologist Andrew Beck '02 MMSc'06 MD'06, PhD. The Boston-based startup takes digitized images of patient specimens and analyzes them using artificial intelligence to improve the diagnosis and staging of diseases like cancer, and patients' responses to therapies.

"We are building and validating technologies with the goal of making the diagnoses of pathologists more accurate, more reproducible, more predictive, and more efficient so they can impact patients in a positive way," Beck says. The company, which has 70 employees, has raised $75 million and signed partnerships with companies like Bristol-Myers Squibb and Novartis, he says.

Beck first got into digital pathology at Brown, where he worked with Murray Resnick, MD, PhD, a professor of pathology and laboratory medicine, on computerized image analysis for Barrett's esophagus, a complication of GERD, to determine the grade of dysplasia and its progression toward cancer. "The technology was much more primitive than what computers are capable of today," Beck says, "but even then I was drawn to the intersection of computational analysis with images of tissue samples to extract new types of information."

PathAI is working to analyze every major type of solid cancer, and is expanding into liver disease, to help pathologists make rapid and accurate diagnoses. But it's not after anyone's job, Beck says.

"In many areas where AI is making an impact, the jobs that it is helping people to do better are in demand," he says, often because these jobs are becoming more complex. For example, in immuno-oncology, AI can help count every single immune and tumor cell and study how they relate to each other to help predict drug response. Meanwhile, Beck says, humans can spend more time "understanding how the diagnostic information relates to the best treatment for an individual patient."

For many serious diseases, pathology is the "ground truth," Beck says: it influences diagnosis, enrollment of patients in clinical trials, decisions about who does and doesn't have cancer, and who should get an aggressive treatment versus watching and waiting. "We want to make sure that every patient has the best chance of receiving the right diagnosis, whether they're in Boston, Providence, or Topeka," he says. **—MARY STUART**

MAKING HER MOVE

After nearly 20 years at Brown, Maureen G. Phipps RES'98, MD, MPH, has become the new chief executive officer of the American College of Obstetricians and Gynecologists. As CEO, Phipps' primary responsibility will be to drive ACOG's strategic vision and continued organizational growth and advocacy for the ob/gyn profession. She will also oversee the execution of ACOG programs and day-to-day operations and provide leadership to more than 250 staff members with the help of her executive team.

Phipps completed her BS in biology at Boston College, MD at the University of Vermont College of Medicine, and residency at Brown and Women & Infants Hospital before earning her MPH from the University of Michigan School of Public Health. After her fellowship at the U-M Medical Center, she returned to Providence to join Brown's faculty in 2001. She was the chair and Chace-Joukowsky Professor of Obstetrics and Gynecology; assistant dean for teaching and research in women's health; professor of epidemiology; chief of ob/gyn at Women & Infants; executive chief of ob/gyn for Care New England; and member of the Executive Committee of the Hassenfeld Child Health Innovation Institute.

PHOTOGRAPHY: RICHARD HAWKE; COURTESY CARE NEW ENGLAND

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

CLASS NOTES

ALUMNI

1970s

Arthur Horwich '72 MD'75 won the 2019 Dr. Paul Janssen Award for Biomedical Research. The award, which was established by Johnson & Johnson in 2004 and comes with a $200,000 prize, recognized his "revolutionary insights into chaperone-mediated protein folding." He's the Sterling Professor of Genetics and Professor of Pediatrics at Yale and a Howard Hughes Medical Institute investigator.

Elizabeth Ruedisueli George '73 MD'76, P'02 P'02, and **Robert George II** '73 MD'77, P'02 P'02, wrote to the *BAM* that they are "sorta" retired after 38 years in family practice in Mercersburg, PA. Bob still fills in at the office "as needed." They continue with nonprofit work to promote community wellness through walkability/bikeability, waterway revitalization, and healthy eating programs; check out www.healthyeatingadventure.org. They'll also be golfing, biking, hiking, and traveling to visit their grandchildren and daughter Megan George Herold '02 in Wyoming; son Ben George '02 in Canada; and daughter Ann in Orlando, FL.

Jeffrey Austerlitz '74 MD'78 retired after 40 years in practice. He spent the last 14 years practicing primary care at the Providence VA Medical Center and heading up its third-year medicine clerkship outpatient experience for the Warren Alpert Medical School, where he was also an assistant professor of medicine, clinician educator. He writes to the *BAM*: "I plan to spend more time with Joanne, my wife of 38 years, my two grown children, three grandchildren, and the rest of my extended family."

Griffin Rodgers '76 MMSc'79 MD'79, MBA, director of the National Institute of Diabetes and Digestive and Kidney Diseases at the NIH, was the keynote speaker at the commencement ceremonies of Albany Medical College in May. He also received an honorary degree.

1980s

Judith Owens '77 MD'80 spoke at and sponsored the annual Irene Owens Memorial Lecture for House Staff in memory of her late mother, who was the continuing medical education officer at the Warren Alpert Medical School for many years. Held by Brown's Office of Women in Medicine and Science in April, panelists included **Lauren Hedde** RES'14, DO, cofounder of a Rhode Island-based primary care practice, Direct Doctors (see *Brown Medicine*, Spring 2018). Attendee **Marlene Cutitar** '83 MD'86 RES'92, a clinical assistant professor of surgery at the Medical School, writes that Lauren and other panelists "gave insight into the theme of fulfilling career paths outside of academia."

Seth Berkley '78 MD'81 is president and CEO of Gavi, the Vaccine Alliance, a public-private partnership working to improve access to vaccines in lower-income countries. Gavi is providing about $50 million to fund the first phase of malaria vaccine pilots in Kenya, Ghana, and Malawi.

Michael Adesman '79 MD'82 was named one of the Best Cardiologists in Philadelphia by Kev's Best. He completed residency and fellowship at Temple University. He sees patients at Crozer Chester Medical Center and is affiliated with Riddle Memorial Hospital.

Yale professor and HHMI investigator Arthur Horwich won the 2019 Janssen Award.

Kevin Grimes '79 MD'82, P'10, MBA, MA, professor of chemical and systems biology at Stanford and codirector of the Stanford SPARK Translational Research Program, joined the scientific advisory board of the Kenneth Rainin Foundation. The foundation's health program supports research into inflammatory bowel disease.

Edward Chu '80 MMSc'83 MD'83, professor of medicine, pharmacology, and chemical biology, chief of the division of hematology-oncology, and deputy director of the University of Pittsburgh Medical Center's Hillman Cancer Center, was appointed chair of the newly formed global clinical and scientific advisory board at TRIGR Therapeutics, a biotech company in Irvine, CA.

Yul Ejnes '82 MD'85 RES'89 is chair-elect of the American Board of Internal Medicine board of directors. Yul, a clinical associate professor of medicine at the Warren Alpert Medical School, practices at Coastal Medical, in Cranston, which he cofounded in 1995. He's been a member of the ABIM board since 2016 and also sits on its internal medicine board.

Patricia Recupero MD'85 RES'89 received the 2019 Manfred S. Guttmacher Award from the American Psychiatric Association (APA), the American Academy of Psychiatry, and the Law and APA Foundation. The award recognizes an outstanding contribution to the literature of forensic psychiatry. She is president emerita of Butler Hospital and a clinical professor of psychiatry and human

behavior at the Warren Alpert Medical School.

Eric Sievers '85 MD'88 is the chief medical officer of BioAtla, a global biotechnology company. He previously was CMO of Trillium Therapeutics.

1990s

Fabio Benedetti '87 MD'90 is the chief medical officer of Apollomics Inc., a biopharmaceutical company that researches and develops oncology combination therapies. He has worked more than 20 years in oncology clinical development and medical affairs, most recently as global chief medical officer at Taiho Pharmaceutical Co. in Tokyo. Prior to his career in industry, he was an attending in the Division of Gastrointestinal Oncology at Memorial Sloan Kettering Cancer Center in New York.

Rex Chiu '89 MD'94 and brother **Frank Chiu** '91 MD'95 were among several Brown alumni who attended a West Coast reunion of Phi Kappa Psi in San Francisco. Rex writes to the *BAM*: "We talked about returning to the 30th reunion en masse in the spring."

Michelle Melicosta '90 MD'94, MPH, is the medical director of the Inpatient Pediatric Neurorehabilitation Unit at the Kennedy Krieger Institute in Baltimore. Her clinical and research interests include acute flaccid myelitis, neuro-oncology rehabilitation,

Top left: Michelle Diop MD'19 pauses for a Commencement photo with Professor of Medicine Fred Schiffman, MD P'96MD'00,center, who taught both her and her father, Djiby Diop '79 MD'85 MMSc'86, right. Above: Peter Thompson '80 MD'84, P'15, delivers the Sauber Distinguished Medical Alumni Lecture. Left: Grace Kuo '90 MD'94, left, and Liza Donlon MD'94 reconnect over a yearbook. Below left and right: former anatomy lab partners Lisa Taitsman '90 MD'94, Robert T. Yanagisawa '90 MD'94, Edmond Paquette MD'94, and Rohina Gandhi-Hoffman '90 MD'94 recreated their graduation day photo at their 25th Reunion.

PHOTOGRAPHY: DAVID DELPOIO

and complex pediatric care in low-resource settings. Michelle lives in Ellicott City, MD, with her husband and two sons.

Odalys Machin Croteau MD'95 joined UMass Memorial Health Care. Previously she practiced internal medicine and sleep medicine at Sterling Family Medicine in Sterling, MA. She completed her internal medicine residency and critical care and pulmonary medicine fellowships at UMass.

Enoch Choi '92 MD'96 received the Outstanding Professional award from the Palo Alto Chamber of Commerce in May. He is a family medicine physician with Santa Clara Valley Medical Center in San Jose, CA, and medical director of Jordan International Aid, a not-for-profit that provides disaster relief as well as development work around the world. Enoch also volunteers at Peninsula HealthCare Connection, a Palo Alto medical clinic that provides care to people who experience homelessness.

Colette Whitby MD'96 RES'97 joined Attleboro Surgical Group in Attleboro, MA. She provides comprehensive surgical services and specializes in breast surgery. She completed her surgery internship at Rhode Island Hospital and residency training at Boston Children's Hospital and Beth Israel Deaconess Medical Center. She spends her free time with her husband and family, and loves classic VW Beetles and Mustangs.

Myechia Minter-Jordan '94 MD'98, president and CEO of The Dimock Center (see *Brown Medicine*, Spring 2016), a public health center in Roxbury, MA, received an honorary degree from Newbury College.

2000s

Andrea Anderson '96 MD'00 received the 2019 Advocate Award from the Society of Teachers of Family Medicine at their annual conference in April. The award honors an STFM member for outstanding work in political advocacy. Andrea is an assistant professor at the George Washington University School of Medicine; the director of family medicine at Unity Health Care, a federally qualified health center in Washington, DC; and the chair of the DC Board of Medicine. Her numerous honors include the 2015 Early Achievement Award from the Brown Medical Alumni Association.

Kamel Addo MD'01 RES'04 F'09 F'10 is a cardiologist at Mount Carmel Columbus Cardiology Consultants in Columbus, OH. He completed his residency in internal medicine and fellowship training in cardiology and cardiac electrophysiology at Rhode Island Hospital. Board-certified in cardiovascular disease and cardiac electrophysiology, he was named a Top Doctor by *Columbus Monthly* in 2018.

Roxanne Vrees '98 MD'03 RES'07 became the associate dean for student affairs at the Warren Alpert Medical School in September, where she oversees the Office of Student Affairs as it supports medical students' personal and professional development. She is an assistant professor of obstetrics and gynecology and the medical director of the Division of Emergency Obstetrics and Gynecology at Women & Infants Hospital. She also serves on the Care New England Medical Group board of managers and the Office of Diversity and Multicultural Affairs Advisory Group. Roxanne completed her residency in ob/gyn at Brown, and recently was one of three faculty members inducted into the Alpha Omega Alpha Honor Medical Society. Her areas of clinical interest and expertise include trauma in pregnancy and caring for sexual assault survivors.

2010s

Almaz Dessie '07 MD'11 F'17 married Michael Moffat, MD, on October 7, 2018, at the Belle Isle Boat House in Detroit. **Kira Neel** '05 MD'19 officiated. Almaz is an assistant professor of emergency medicine and of pediatrics at Columbia University Medical Center and practices pediatric emergency medicine at NewYork-Presbyterian Morgan Stanley Children's Hospital. Michael is a pediatric hospitalist at NYU Langone Hospital. They met in 2012 during their pediatrics residency at UCSF and share a love of music, global health, and travel. Attendees included Almaz's sister **Sybil Dessie** '04 MD'08, **Monica Kaitz** MD'11, **Ali John Zarrabi** '06 MD'12, and **Elizabeth Anto** '06 MD'11.

Sunny Intwala MD'12 joined The Heart Center in Poughkeepsie, NY, where he's a cardiologist specializing in advanced cholesterol management, sports cardiology, and cardiac rehabilitation. Previously he was director of sports cardiology and associate director of nuclear cardiology at Lenox Hill Hospital in Manhattan. Sunny completed his residency in internal medicine at Northwestern and his cardiology fellowship at Boston Medical Center.

Jonathan Liu MD'12 was appointed deputy secretary of policy and strategic planning at the California Health and Human Services Agency by Governor Gavin Newsom. Jonathan, who's the deputy director of the Center for Health and Social Impact for Los Angeles County, completed his internal medicine residency at Penn's Perelman School of Medicine and served as chief resident in Quality and Patient Safety at the Philadelphia VA Medical Center.

William Brucker '04 MD'13 PhD'13, a fellow in clinical genetics and genomics at Boston Children's Hospital and Harvard Medical School, received a Takeda/ACMG Foundation Next Generation Fellowship Award to help fund his work advancing the clinical care of individuals with inborn errors of metabolism. He completed his pediatric residency training at UConn School of Medicine.

Grayson Armstrong MD'15, MPH, was elected to the

resident and fellow seat on the American Medical Association's board of trustees. He began serving as an AMA delegate while in medical school. This year he is chief resident at Harvard Medical School, where he's an instructor in ophthalmology and director of the Ocular Trauma Service at Massachusetts Eye and Ear.

Samuel Miller '11 MD'18 and **Kimberly Glerum** '15 MD'20 married August 9 at the Inn at Longshore in Westport, CT. Sam is a general surgery resident at Yale. They met playing club tennis at Brown.

RESIDENTS

1980s

Deborah Myers RES'85, MD, P'17, is the director of the Division of Urogynecology and Reconstructive Pelvic Surgery and vice chair of the Department of Obstetrics and Gynecology at the Warren Alpert Medical School. She's also a professor of ob/gyn at Brown and practices at Women & Infants Hospital.

C. James Sung RES'87 F'88 RES'90, MD, was appointed chief of pathology and laboratory medicine at Women & Infants Hospital, executive chief of pathology and laboratory medicine at Care New England, and vice chair of pathology and laboratory medicine at the Warren Alpert Medical School. He had served as interim chief since 2017. He is a professor of pathology and laboratory medicine and program director of the Stuart C. Lauchlan and International Visiting Fellowships in Women's Pathology at Women & Infants/Brown. He serves as the faculty liaison for the Brown University-National Cheng Kung University College of Medicine Exchange Program, as well as the division commissioner for Rhode Island and Connecticut for the College of American Pathologists Commission on Laboratory Accreditation.

2000s

Megan Ranney RES'08 F'10 MPH'10, MD, associate professor of emergency medicine at the Warren Alpert Medical School, was named the 2019 Rhode Island Medical Women's Association Woman Physician of the Year. The annual award recognizes excellence in the field of medicine along with outstanding community involvement. Megan is the chief researcher and co-founder of AFFIRM (American Foundation for Firearm Injury Reduction in Medicine); co-chaired the Governor's Gun Safety Working Group; and served as the Rhode Island representative on the multi-state Governors' Work Group on Firearm Injury Research. She also received the Aspen Institute Health Innovators Fellowship, a two-year program for health care leaders.

2010s

Benjamin Brown RES'10, MD, joined Kaiser Permanente Moanalua Medical Center, where he practices emergency medicine. He attended the University of Michigan Medical School and completed his EM residency at Brown. Before moving to Hawai'i, he worked in the Level III trauma center at White Plains Hospital in White Plains, NY.

Todd Peters RES'10 F'11, MD, is the vice president and chief medical officer of Sheppard Pratt Health System in Baltimore. He joined Sheppard Pratt last year as its medical director of child and adolescent services and chief medical information officer. He completed his residency in psychiatry and fellowship in child and adolescent psychiatry at Brown.

Lauren Hedde RES'14, DO. See **Judith Owens** '77 MD'80.

Chioma Anjou RES'15, MD, MPH, is a gastroenterologist at Charlotte Hungerford Hospital in Torrington, CT. She completed her internal medicine residency at Brown and her gastroenterology and hepatology fellowship at UConn. She earned her Master of Public Health at Columbia, where she concentrated in health policy and management.

FELLOWS

2000s

Eric Berthiaume F'05, MD, is the president of University Gastroenterology in Providence. He's also a clinical assistant professor of medicine at the University of New England College of Osteopathic Medicine and provides consultative services at Kent County Memorial Hospital and the Roger Williams Medical Center. Eric completed his gastroenterology fellowship at Brown.

Kristen Matteson F'05 MPH'06, MD, is the vice chair for research for the Department of Obstetrics and Gynecology and an associate professor of ob/gyn at the Warren Alpert Medical School; the chair of the Academic Council for Care New England; and an attending at Women & Infants Hospital and Thundermist Health Center in Woonsocket, RI.

Nicole Alexander-Scott F'09 MPH'11, MD, director of the Rhode Island Department of Health, received an honorary degree at the 2019 commencement ceremonies of Bryant University. In 2018, her peers elected her president of the Association of State and Territorial Health Officials.

2010s

Amanda Noska F'15, MD, MPH, joined the Essentia

Andrea Anderson received the Society of Teachers of Family Medicine's Advocate Award.

Health-Duluth Clinic in Duluth, MN, in April. She graduated from the University of Minnesota Medical School and completed her residency in internal medicine at Hennepin County Medical Center in Minneapolis and infectious disease fellowship at Brown. Before returning to her home state, she was an infectious disease physician at the Providence VA Medical Center and an assistant professor of medicine at Brown.

IN MEMORIAM

Marie Anne Johantgen MD'87, 60, of Olympia, WA, died November 16, 2018. She earned her undergraduate degree at the University of California, Irvine. After medical school, she completed a residency in obstetrics and gynecology at the University of Colorado. She spent most of her career at Kaiser Permanente locations in Olympia and California, using her skill and compassion to make a positive impact on the health and well-being of countless women.

In 2009, Dr. Johantgen started a local chapter of Dining for Women, a "global giving circle" that works to eradicate poverty and support health, safety, and gender equality for women and girls by funding grassroots projects throughout the developing world. Her passion for service inspired trips to Haiti, Peru, Kenya, Rwanda, and India, where she assisted those needing medical care. She also volunteered at the local Olympia Free Clinic and Rotary Club.

Dr. Johantgen received the Olympia YWCA's Women of Achievement Award for her many accomplishments in 2017. She is survived by her husband, Richard; a son; a stepson; her parents; five siblings; and a niece.

Andrea Kretzschmar RES'06, MD, 43, of Chepachet, RI, died February 7. Born in Huntsville, AL, she earned her medical degree from the University of Texas Southwestern Medical Center. After completing her residency in psychiatry at Brown, she spent 13 years on the staff at Butler Hospital working in Patient Assessment Services, the Partial Hospital Women's Program, the Alcohol Drug Day Program, and the Integrated Therapies Program. With board certifications in both psychiatry and addiction medicine, Dr. Kretzschmar transitioned to the Providence VA Medical Center's Collaborative Addiction Recovery Services program in 2015, where she continued treating patients with substance use disorders.

Dr. Kretzschmar was a clinical assistant professor of psychiatry and human behavior at the Warren Alpert Medical School. In 2017, she received the Medical School's Dean's Excellence in Teaching Award. She supported the local community through her involvement in the Rhode Island Psychiatric Society and as a board leader for the Rhode Island Society for Addiction Medicine. She received the Disabled American Veterans Outstanding Physician Award posthumously. She is survived by her husband, Daniel W. Pearson; three children; and two sisters.

To honor her legacy at Brown, her friends, family, and colleagues established the Dr. Andrea Kretzschmar Addiction Psychiatry Training Fund to support future psychiatrists to provide exceptional care to patients with substance use disorders. Gifts can be made by check, payable to Brown University (write Andrea Kretzschmar Fund on the memo line) and mailed to Brown University Gift Cashier, Box 1877, Providence, RI 02912; or at brown.edu/go/Andrea.

Joseph L. Johnson MD'96, 49, died February 26 in Nashville, TN. After completing medical school at the Warren Alpert Medical School and a residency at the McGaw Medical Center of Northwestern University, he was board certified in internal medicine. Dr. Johnson also moonlighted as a musician, singing and composing songs under his stage name Ian Stork. He is survived by his mother and brother.

Alan Richard Cote MD'79, 67, of Barrington, RI, died May 5. He was born in Providence and raised in Pawtucket, and was a football and baseball star at Tolman High School before graduating top of his class from the University of Rhode Island. After earning his MD at Brown, he completed three residencies: surgery at Yale, neurology at Brigham and Women's Hospital, and ophthalmology at Tufts Medical Center. He then completed a neuro-ophthalmology fellowship at Massachusetts General Hospital.

Following his fellowship, Dr. Cote opened an ophthalmology practice in Fall River, where he saw patients for 32 years. He maintained a lifelong passion for learning and a sense of self-discipline, embodied in his black belt in taekwondo, but he's remembered as a generous, soft-spoken, quick-witted, and loving husband of 37 years to Leslie Cote. He is survived by his wife, five children, two grandchildren, a brother and sister, and several nieces and nephews.

Nashwa Ali Holt '98 MD'02, 45, of Brookline, MA, died May 13. Born in Springfield, MA, Dr. Holt was a longtime Providence resident, attending Lincoln School for 12 years before coming to Brown as a PLME. She trained in anesthesiology at Beth Israel Deaconess Medical Center and Harvard, and later worked for Tufts Medical Center. Dr. Holt was a gifted doctor, a beloved daughter and sister, and a wonderful friend. She is survived by her sons, William and Luke; her parents, M.F. Moustafa Ali, MD, and Safaa Ali, MD; her sister, **Iman Ali** '92 MD'97, and her brother-in-law, Bahram Pahlavi '92.

Aisling Galligan MD'21, MS, 29, died of lung cancer August 6 at HopeHealth Hulitar Hospice Center in Providence. Born in Baton Rouge, LA, and raised in Knoxville, TN, Aisling also lived in Auckland, Seattle, London, Oakland, and Nashville. She graduated from Dartmouth with honors in 2011, majoring in anthropology, and received her master's in skeletal and dental bioarcheology from University College in London, with distinction, in 2014. She had a keen interest in pathology and worked with a forensic pathologist at the Alameda County Coroner's office before matriculating at Brown in the fall of 2017 with members of the current third-year class. She is survived by her parents, brother, two sisters and brothers-in-law, and many friends. Donations in her memory may be made to HopeHealth, www.hopehealthco.org.

MOMENTUM

BROWN TOGETHER

Celebrating today, the gifts for tomorrow

The close of the 2019 fiscal year is a perfect moment to thank the more than 2,300 donors who supported the Warren Alpert Medical School of Brown University. It was a tremendous year with many accomplishments to celebrate due in part to their philanthropy. We'd especially like to thank those in the Brown medical community who included Brown in their retirement planning.

Planned Giving is an important component of the BrownTogether campaign, and we have been encouraging our community to consider ways they can support Brown without a major cash gift. A special thanks goes out to **Patricia A. Buss '78 MD'81 RES'87**, who made the Medical School the beneficiary of her retirement account. This is an amazing opportunity to receive gift credit for the value of your account, while giving Brown the opportunity to celebrate your support. Pat is helping to lead the way and is sharing her story with others.

There are so many other ways to support Brown—including a gift of real estate, closely held business stock, or gifts that provide income to the donor or beneficiaries. The impact of any of these could be exponential. To learn how one planned gift benefited more than 30 students, please take a moment and watch the video at **www.brown.edu/go/30scholars**.

Many institutions have received transformational gifts through estate planning. We at the Medical School are grateful to all those who had the foresight to see our bright future and help us soar to greater heights.

Progress to Goal

INVESTING IN STUDENTS

Planning Ahead

When it came time for **Patricia A. Buss '78 MD'81 RES'87, MBA**, to make estate plans, she thought carefully about how she could continue her legacy of service to Brown while also making a difference in the lives of medical students. "Brown provided not only my education, but also my worldview," Buss says. "I wanted to be part of the Medical School's future—to change what's possible in medical care."

To that end, Buss decided to name, through the Brown Medical Annual Fund, Brown's medical students as the beneficiaries of her retirement account. For years, Buss has shared her expertise with Brown. Active with the Brown Medical Alumni Association, she served on the board of directors from 1985 to 1996, returned in 2014, and is now president-elect. She also sits on the President's Advisory Council on Biology and Medicine.

Buss began her work as a physician as a plastic surgeon at Naval Hospital Oakland in California and spent the bulk of her career with the US Navy. Since leaving the military, Buss has served as chief medical officer at Health Net, LLC, a health insurance company.

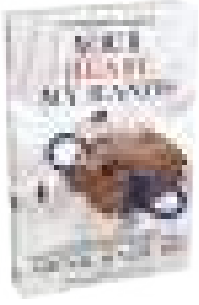
With her planned gift, Buss joins more than 1,000 members of the College Hill Society who want to ensure that Brown continues to thrive. "It gives me joy to think that my planned gift, an IRA, will continue to grow and provide even more support to the Medical School," she says.

"The University's BrownTogether campaign inspired me to stretch," she continues. "I frequently recall a marketing professor's comments from years ago: 'If you want to know what's important to someone, look in their checkbook.' Now, I look at the statement for the account I've earmarked for Brown and I know that I've taken a concrete step in the direction of living my values."

The Gift of Wisdom

Arun Singh, MD, knows he's the most unlikely person to become a renowned cardiac surgeon. Growing up in India in the 1940s and '50s, he was dyslexic, mischievous, and suffered fractures in both arms, leading to temporary paralysis in his dominant hand.

Your Heart, My Hands: An Immigrant's Remarkable Journey to Become One of America's Preeminent Cardiac Surgeons is Singh's autobiographical account of his journey after medical school in India and surgical training in the US. Taut and vividly descriptive, the book is a wild ride detailing multiple acts of divine intervention, Singh's ability to transform his rebellious side into perseverance in a demanding field that was not entirely welcoming to a person of color, and finally his rise to prominence as a professor and cardiac surgeon who performed 15,000 lifesaving surgeries.



Those worlds collided one day in the operating room when a Brown medical student was observing the patch procedure he was performing on a child with a hole in his heart. The reason for the student's unusual understanding of

INVESTING IN STUDENTS

The Gift of Wisdom CONTINUED

the technique soon became clear: Singh had successfully performed the same procedure on her when she was 8 years old.

After his retirement from surgery three years ago, Singh's wife suggested he put his life story down on paper. The book has taken off, and now Singh's "retirement" is filled with book signings, talks, and interviews for news outlets around the country.

One of Singh's patients, **Warren Galkin '51**, donated a copy of the memoir to all Warren Alpert Medical School students and to students in the Bryant University Physician Assistant Program (where Singh currently teaches).

"The media—politicians—everyone says the American dream is over," says Singh, a clinical professor emeritus of surgery. This book shows that "the American dream is alive. It's a shining beacon. If you have a dream and you're willing to work hard and you have grit and are willing to accept disappointments, you'll overcome obstacles."

INVESTING IN FACULTY

Supporting New Leadership in Migraine Research

One of Brown's strengths is its ability to bring together teams of physicians and scientists across disciplines to solve a problem. Migraine disease is a worthy opponent, affecting 12 percent of the US population, including children. Not only are migraine disorders crippling, the economic burden is severe, costing patients and employers billions per year. To make matters worse, there are not enough providers with expertise to treat them.

Brown is committed to better serving the needs of patients who suffer from migraine disease, and this includes a pledge to train the next generation of physicians to provide care and seek new therapies for those affected. Thanks to this initiative, leadership in this area is going to come in the form of the newly established University Professorship in Migraine Research and Clinical Sciences.

A major priority of the BrownTogether campaign, endowed professorships are essential to Brown's ability to attract and retain the very best scholars to teach, conduct research, and improve the lives of patients. "A faculty leader in migraine research will position Brown well to make an important contribution to a field with much promise, and to address a critical need for our patient community," says Louis B. Rice, MD, Joukowsky Family Professor of Medicine and chair of Brown's Department of Medicine. By gathering specialists from fields like brain science, gastroenterology, immunology, medicine, neurology, ophthalmology, otolaryngology, and women's health, the University Professor of Migraine Research and Clinical Sciences will delve into the underlying causes of the disorder and elevate the understanding of migraine disease. Jointly appointed in the departments of neurology and internal medicine, the professor's goals will include conducting innovative clinical research and providing care across disciplines for migraine patients. Thanks to this gift, Brown will also be positioned for growth through potential philanthropy, research grants, and commercialization.

INVESTING IN FACULTY

Designing Woman

Most orientation speeches to incoming students are likely forgotten shortly after they are given. But a portion of the one delivered by then-Brown President Howard Swearer to the Class of 1988 was remembered by at least one individual: Liz Lange.

"It went something like this," she says. "'At Brown, we attract the best students in the country. Then we have the good sense to stay out of their way.'"

She took that to heart.

Although Lange knew she wanted to study "something English-related," she benefited from the Open Curriculum by taking a class in pre-law, and one of Professor Barrett Hazeltine's legendary management and entrepreneurship courses: ENGIN 9 (Management of Industrial and Nonprofit Organizations).

"I had no idea that I would start my own business," Lange says. "'Entrepreneur' wasn't a popular word in the 1980s, nor was it anything that was on anyone's mind—at least not at Brown. But we were taught how to think; how to look at the world differently and critically."

Post-graduation, a degree in comparative literature in hand, Lange segued from writing for *Vogue* to, in less than a decade, almost single-handedly revolutionizing the style of maternity fashion design. Initially handling design, production, public relations, sales, and shipping of Liz Lange Maternity on her own, the lessons in analyzing, in choosing new ways to view the industry, stood her in good stead.

And when, in her 30s, Lange developed cervical cancer, making choices—this time ones that would ensure her health—was paramount in her mind. "It was a very scary time for me," she remembers. "Here I was, trying to manage my business, but first and foremost I wanted my two kids to keep their mom."

So upon beating the disease, in addition to designer and author (two columns and a book), Lange added another title to her resume: cancer research advocate. She took that to heart, too, devoting time and talent to various boards and charitable organizations.

When President Christina Paxson suggested that Lange establish a professorship in women's health at the Warren Alpert Medical School, she responded enthusiastically: "I've spent years supporting women in many different ways. Helping other women, especially around the area of women's health, means a lot to me. This professorship is the perfect way to align my appreciation of Brown, my love of Brown, with my personal life post-Brown.

"You can't predict the future. But who knows?" Lange says. "In the years to come, the health of not only my daughter but of countless other daughters, sisters, and wives may be better because of the research and scholarship of the individuals who will hold it."

It's What We Do

Physicians suspend judgment of those in need of their care.

I learned something working on this issue of *Medicine@Brown*. When someone says to you, "You're brave," you will immediately stop and reconsider what you're doing.

Such was the case when Sean Love told me I was brave for publishing his chronicle of medically evaluating Julian Assange. Assange is a complicated figure, one accused of serious, damaging crimes, including sexual assault. Not exactly the makings of a puff piece. But Assange is also a human being, and if you believe that every human being has a fundamental right to health care, as I and most of the physicians I know do, then even Julian Assange should receive medical attention. Love's international mission to assert that right is a compelling and thought-provoking tale.

I've thought about the moral crises doctors must grapple with when required to provide care to a person who has done things they find reprehensible. After the Boston Marathon bombings in 2013, emergency medicine physicians and trauma surgeons provided world-class care, no treatment spared, to the two bombers in hospital bays where days before they had treated the victims of the terrorists' bombs. In an interview with The Marshall Project, Stephen Odom, a trauma surgeon at Beth Israel Deaconess Medical Center, unequivocally shut down the question of whether a bad person like Dzhokhar Tsarnaev "deserved" the lifesaving care he received. "Even people who are incarcerated for terrible stuff still get care. It's just what we do," Odom said.

It's no surprise it was a Brown-trained doctor who raised the issue of Assange's access to care and fought for a medical team to evaluate him. There's a long tradition at the Warren Alpert Medical School of advocating for those with the least agency—from the ongoing work with the state Department of Corrections to the Center for Prisoner Health and Human Rights to the asylum clinic that Love founded and which continues today.

No one asks if the patient before them deserves care. By virtue of being human, they have the right.

—KRIS CAMBRA, Editor

I was delighted to read "True Colors" in the last issue. I am extremely proud of the fact that Brown has made LGBTQ+ health a required portion of the curriculum. I would like to point out, however, that there was a great deal of work that came before. When I matriculated in 2007 there was Queer Med, pioneered by Melissa Donovan MD'07 and John Kelleher '93 MD'07. This became GLAAM under the leadership of Andrea Lach Dean MD'11 and Jason Lambrese '06 MD'10, who were instrumental in getting LGBTQ+ health care into the Doctoring curriculum and even designed an elective course, which Virginia Sanders MD'11 and I continued the following year. Portions of these courses were also included in the Doctoring curriculum those years as well. Though we yet have much work to do, I am proud to be an alum of Brown and of our forward-thinking legacy.

PATRICK WORTH MD'11,
via email

WHAT SAY YOU? Please send letters, which may be edited for length and clarity, to: Medicine@Brown, Box G-P, Providence, RI 02912; med@brown.edu; or via social networks, which can be found at medicine.at.brown.edu.

TODAY'S STUDENTS / TOMORROW'S PHYSICIANS

"One of the highlights of my first year of medical school has been combining my passion for photography and media with my interest in women's health. Through the school's Physician as Communicator track of the Scholarly Concentration Program, I am working on a digital media project documenting black women's experiences navigating the reproductive health care system. I am grateful that the Warren Alpert Medical School supports students in their creative endeavors. My ability to explore media and medicine has greatly enriched my experience."

Adeiyewunmi (Ade) Osinubi '18 MD'22

Your support of the Brown Medical Annual Fund (BMAF) enables students like Ade to expand their interests in medicine.

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Questions? Email bmaf@brown.edu

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EAST MEETS WEST

In August a pedestrian bridge over the Providence River, just steps away from the Medical School, opened to much fanfare. It was instantly popular with students, faculty, and staff for its seating areas, chess boards, and easy access to the East Side.

PHOTOGRAPHY: MIKE COHEA