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MEDICINE@BROWN

***ONE WISH*, BY CHARLOTTE LEE MD'21**
CHIANG MAI, THAILAND, NOVEMBER 2015
I took this photo while I was working at a nonprofit in Chiang Mai, Thailand, after college. It was Yi Peng, an annual Lanna festival on the full moon of the second month, a time to "make merits" in the Buddhist culture. Many sky lanterns are released as a part of the festivities. At that time, I was doing maternal and child health work that I loved, had a wonderful new community of friends, and I was told to make a wish when we released this lantern. I had a hard time coming up with even one wish, because I was so happy and my life was so full.

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ON THE COVER:
Stroke survivor Lori Camara

PHOTOGRAPH BY JESSE BURKE

Exciting Times

Greetings from Providence! The growth of the research footprint and the ongoing success of the Brown Institute for Translational Science (BITS) continue to be the top stories in our corner of the world.

Earlier this year we welcomed renowned oncologist and researcher Wafik El-Deiry, MD, PhD, as the inaugural associate dean for oncologic science and director of the Brown-Lifespan Joint Program in Cancer Biology. Dr. El-Deiry is already making progress toward our goal to develop a basic and translational cancer research program of national and international stature. You'll read more about his work on page 46 of this issue of *Medicine@Brown*.

We have also made strides toward building a clinical neuroscience center and a program in Alzheimer's and neurodegenerative diseases within BITS, under the direction of Eric Morrow, MD, PhD, the Mencoff Family Associate Professor of Biology. Two new scientists will be joining this center in the fall. Gregorio Valdez, PhD, joins us from the Virginia Tech Carilion School of Medicine, as an associate professor of molecular biology, cell biology, and biochemistry. Alvin Huang, MD, PhD, will be coming to us from Stanford to become an assistant professor of molecular biology, cell biology, and biochemistry. These additions to our already stellar roster of scientists and the expertise found in the Carney Institute for Brain Science will focus our resources on expanding our understanding of these debilitating brain diseases.

To be sure, these recruitments would not be possible without the tremendous generosity of donors. Gifts to the *BrownTogether* campaign are helping us achieve our goal to make Brown a leader in translational science.

In addition to research, our innovations in medical education continue to bear fruit, as you'll read in this issue. The first class of dual-degree recipients in the Primary Care-Population Medicine program are graduating this month. We are also among the first medical schools in the country to integrate content on caring for people who identify as transgender into the required curriculum. Our faculty, students, and staff continue the work outlined in the Diversity and Inclusion Action Plan to ensure we are creating the best learning environment for our students and their future patients.

We look forward to continuing to partner with all of you to sustain this growth at the Warren Alpert Medical School.

—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

Old Drug, New Trick?

As cells age, certain cellular functions start to fail, taking our bodies down with them. Sorting out what those failures are, and how they happen, keeps the field of aging research humming.

In *Nature* in February, a team of scientists led by Brown's John Sedivy, PhD, reported an intriguing parallel between aging cells and retroviruses like HIV. And based on that finding, they used a generic HIV/AIDS drug to significantly reduce age-related inflammation and other signs of aging in mice.

"This holds promise for treating age-associated disorders," says Sedivy, the Hermon C. Bumpus Professor of Biology. "Not just Alzheimer's but many other diseases: type 2 diabetes, Parkinson's, macular degeneration, arthritis." Inflammation is an important component of such disorders.

The research examined DNA sequences called retrotransposons. Also known as jumping genes, they replicate and "jump" around the genome. Young, healthy cells can keep this process in check, but older ones lose that control. Sedivy's team found that when a class of retrotransposons called L1 replicates in senescent cells, an antiviral immune response—the interferon response—triggers inflammation.

"This interferon response was a complete game changer," Sedivy says.

→ continued on page 06

IMAGE: GETTY IMAGES

← continued from p05

Retroviruses, like retrotransposons, wreak havoc by copying and inserting themselves into host DNA. And both need the same protein to replicate: reverse transcriptase. Drugs that halt that protein are one component of the multidrug cocktails that treat HIV/AIDS. The team wondered: could this class of drugs stop virus-like L1 replication and prevent the inflammatory immune response?

The answer is yes. After testing six HIV reverse transcriptase inhibitors on old mice and senescent human cells, the researchers found lamivudine worked best to block L1 activity and interferon response, with the fewest side effects.

The results were encouraging, Sedivy says, but they have more work to do before they can translate their findings to humans. "We don't actually understand the whole aging problem yet," he says. "The L1 reverse transcripts are at least an important part of this mess." **—MOLLIE RAPPE**

Mechanical Assist

AI can't replace doctors, but it could help them do their job.

With everything physicians have to juggle just to get their job done, wouldn't it be nice to have a little mechanical assistance? That's just what artificial intelligence in medicine aims to provide.

Machine-learning applications can facilitate decision-based medical tasks to support and improve the performance of human care providers. The goal isn't to replace the physician, but to make their job easier and patient outcomes better.

As a Program in Liberal Medical Education concentrator in applied math and biology, Chibuikem Nwizu '17 MD'21 PhD'23 wanted to apply the power of machine-learning tools to stem cell biology.

"I was looking to see if there was a way that I can use my skill set and apply it to this new area," Nwizu says. He found the stem cell lab of Peter Quesenberry, MD, the Paul Calabresi, MD, Professor

OVERHEARD

"It is very frustrating to see hyperregulation again ruining a good thing in health care."

—COLLEEN KELLY, MD, associate professor of medicine, on FDA oversight of fecal microbiota transplants, *New York Times*, March 3, 2019

PHOTOGRAPHY: COURTESY OF BIG OCEAN

MD/PhD candidate Chibuikem Nwizu, left, meets with his PhD mentor, Lorin Crawford.

of Oncology, where Theo Borgovan F'20, MD, a hematology/oncology fellow at Rhode Island Hospital, was doing research. They were happy to teach Nwizu the wet lab techniques to isolate stem cells.

But Nwizu also needed a mentor in computational science. Enter Lorin Crawford, PhD, assistant professor of biostatistics at the School of Public Health.

While not quite familiar with stem cell biology, Crawford says "a lot of my work is motivated by genetics and genomics and we use computational methods to solve complex problems in that broad space." So he was definitely interested in working with Nwizu: "It's like a wide-open, wild, wild West-type thing," Crawford says. "We were in a cool space to do something really special."

Borgovan studies extracellular vesicles—the carrier pigeons found in all cells that relay messages to other cells. Sometimes the message is good, and helps cells heal or grow; sometimes it's a nastygram of toxic information, such as cancer. When Borgovan began isolating EVs from patients with leukemia, he found that healthy EVs can protect other healthy cells, and even kill cancer cells apoptotically, so the cell implodes and causes no subsequent immune reaction.

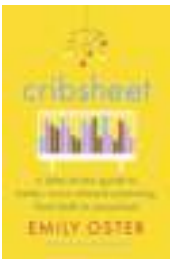
Nwizu, Crawford, and Borgovan began brainstorming research questions that would meld the wet lab with the computer lab. What if they could teach a computer to differentiate the good from the bad EVs at a glance? Let's say a patient has been treated for leukemia and is monitored for recurrent disease. The physician could load the blood sample into the computer and the algorithm could recognize the slightest changes in EVs, detecting recurrent disease early.

"This is where it's so great that we have all this patient data," Borgovan says. Matching the molecular to the clinical outcomes is a powerful tool in machine learning.

"Using the vesicle profile, we could come up with a diagnosis and as we acquire more samples and patient data, the algorithm will also be able to come up with a prognosis," he says.

The algorithms are intended to improve the diagnostic process, Crawford says. "There are elements about a patient that only the clinician who sees that patient can know—'this patient can't have this treatment because of X, Y, and Z that the algorithm doesn't know.' But if we can help find a starting point, we can allow physicians to focus on the parts only they can do."

As a future physician, Nwizu agrees: "Any good tool will not replace the wielder of the tool. It just augments the wielder's accuracy and efficiency." **—KRIS CAMBRA**



BOOKSHELF

EVIDENCE-BASED PARENTING

Emily Oster, PhD, professor of economics and mother of two, delved into the data to help moms-to-be make decisions about their pregnancies in her first book. Now she applies that same evidence-based lens to early childhood so new parents can weigh their options on everything from breastfeeding to day-care to potty training.

In ***Cribsheet*** (Penguin Press), Oster stresses that most choices are just that: choosing what works best, for baby and family. Take co-sleeping: she reviews the literature, suggests factors to consider, and explains what it means to minimize risk. For some, the benefits of bed sharing will outweigh the risks; this book arms parents with the information they need to choose.

Oster presents her findings in an approachable, nonintimidating way. She gives weight to the recommendations of medical societies—as well as the advice of her pediatrician, who tells the bleary-eyed author as she spins with anxiety in her office: don't worry so much. Sometimes, Oster writes, data need to take a back seat to being present and happy with the kids; "there will be many times that you need to just trust that if you're doing your best, that's all you can do." **—PHOEBE HALL**

X-Ray Vision

An aspiring radiologist designs an award-winning algorithm to detect pneumonia.

The third year of medical school is stressful for any student. But Ian Pan '16 AM'16 MD'20 didn't want to pass up the opportunity to compete in the 2018 Radiological Society of North America (RSNA) Pneumonia Detection Challenge.

So last fall, he arranged his clinical rotations so he could devote more than 20 hours a week to his project. Competition was stiff: more than 1,400 teams from across the globe, including industry professionals, physicians, and students, vied to design an algorithm to recognize pneumonia, using more than 30,000 X-ray images provided by the RSNA.

"There are two elements to the task," Pan says. "The first is to figure out if there is pneumonia in the image. If there is, you have to determine where it is and draw a box around it with the algorithm."

His hard work and sleepless nights paid off: in December, Pan and his collaborator, Alexandre Cadrin-Chênevert, MD, a radiologist and computer engineer at CISSS de Lanaudière in Québec, won first place. During one of Pan's presentations, an RSNA committee member praised him as the "future of [the] field."

"I was interested in radiology when I first went to medical school and was trying to figure out ways to incorporate machine learning," Pan says. "I stumbled onto deep learning and realized it was a very powerful tool to build models that could recognize images, which is what a radiologist does."

Ian Pan is devising ways to bring AI to radiology.

In the past three years, Pan has created algorithms to detect lung disease on chest X-rays, head bleeds on CT scans, and thyroid cancer on ultrasounds. The experiences were instrumental in helping him compete in the RSNA challenge.

He also credits his success to the mentorship of Professors Lisa and Derek Merck. Under their guidance, he completed several projects using machine learning, including examining ultrasounds for cancer and X-rays for bone age.

"When he first came in, he had momentum," says Derek Merck, PhD, assistant professor of diagnostic imaging, of engineering, and of radiation oncology. "He had been doing a master's in statistics, so he already had a background in machine learning and had been working with big data sets. Basically when he showed up, he just started looking for data."

"Ian is a hard worker and takes advantage of the resources that are available to him from the data we curate in the lab," adds Lisa Merck, MD, MPH, associate professor of emergency medicine, of diagnostic imaging, and of neurosurgery.

Pan wants to pursue radiology and continue to integrate machine learning and medicine. "Having people who speak both languages [medicine and AI] is really important. AI is going to influence medicine and radiology greatly over the next few decades," he says. "It's important for doctors to figure out how this will happen. Because ultimately, our hope is to use this technology in a way that benefits our patients." **—ANEEQAH NAEEM '20 MD'24**

PHOTOGRAPHY: JORDAN EMONT MD'20

ASK THE EXPERT: ELIZABETH GOLDBERG

Can the Apple Watch accurately diagnose atrial fibrillation?

When Apple released the latest iteration of its smartwatch, the company announced the single-lead EKG built into the device could identify more than 98 percent of wearers who had atrial fibrillation (AFib), an arrhythmia that affects as many as 6 million Americans. But results of a large study at Stanford, presented in March, fell short of that claim. Elizabeth Goldberg RES'13 ScM'17, MD, an assistant professor of emergency medicine and of health services, policy, and practice, who is studying the fall detection capabilities of the Apple Watch 4, talks about the pros and cons of an "anytime, anywhere" EKG.

I think there is great promise here. We see many patients in the emergency department every day who complain of palpitations. We need to do a lot of different investigations to figure out why they're feeling this way. From that standpoint, it would be really helpful if someone said, "My watch is showing that I have atrial fibrillation, and here's the EKG." People with AFib often don't have any symptoms. They might not present for months or years after they have this condition, and be at risk for strokes that entire time.

Individuals 65 years and older who have hypertension or other risk factors for stroke would benefit most from this technology. In a population where the prevalence of a disease is low, such as 25-year-old healthy adults, you're going to get more false positives. That might bring people to the ED who don't have AFib, and it could encourage additional health care costs. You need to weigh the cost and distress caused by false positives with the potential benefit of early detection of a health problem. Most young people should buy the watch if they're interested in its other features rather than as a strategy to detect chronic diseases sooner.

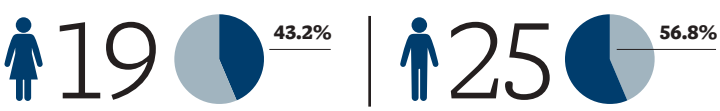
BY THE NUMBERS

Hidden Figures

Just as women mathematicians went unrecognized for their pivotal roles in NASA's early missions, women programmers have toiled behind the scenes in the field of population genetics, rarely credited as authors and instead thanked in papers' acknowledgments. Emilia Huerta-Sanchez, PhD, assistant professor of ecology and evolutionary biology, and collaborators reviewed articles published in *Theoretical Population Biology* between 1970 and 1990 to dispel the myth that women of that era didn't do science.

NUMBER OF AUTHORS

NUMBER OF ACKNOWLEDGED PROGRAMMERS



Source: *Illuminating Women's Hidden Contribution to Historical Theoretical Population Genetics*, Genetics, *February 2019*

ILLUSTRATION: LARA TOMLIN

COOL TOOL

SOBRIETY CHECK

A staggering 88,000 people in the US die each year from alcohol-related causes. But that number is just a fraction of emergency department visits caused by drinking—nearly 5 million in 2014.

Some wind up in the ED after a rare episode of overindulgence, while others are daily drinkers experiencing additional problems like homelessness. All of them are kept in the ED until they appear sober, have no other complications, and can go home safely. It's a seemingly straightforward process.

But certain patients present a conundrum for providers, says Jason Hack, MD, a professor of emergency medicine. "The descriptions of both intoxication and sobriety are very broad and ill-defined and mean different things to different people," he says. "A more accurate description is to detect if someone has alcohol-induced impairment and identify when it resolves."

Hack, who's the director of the Division of Medical Toxicology, says providers have a tool that measures the severity of a patient's withdrawal, but nothing to gauge the degree of their impairment. This opens up two scenarios, both undesirable: in the first, a patient is held against their will and forced to a blood alcohol level of zero, putting them in potentially life-threatening alcohol withdrawal. In the second, the hospital lets the patient go too soon, when they're still impaired, and they get hurt or harm someone else.

Hack saw an opening. "How do you determine when somebody is at their maximal functioning?" he says. "Nobody really knew." Thus the HII score was born. Hack's Impairment Index is a five-part test that, he says, can span providers and shifts, because it objectively quantifies how well a patient performs tasks like speaking clearly, walking steadily, or following a moving object with their eyes.

Justin Benoit, MD, MS, an assistant professor of emergency medicine at the University of Cincinnati College of Medicine, evaluated HII alongside other tools in 2016 and found that "Jason's [scoring system] really works the best." Lamenting the subjective way his ED evaluates patients for intoxication, Benoit says he hopes more researchers will take a look at HII. "I don't think people fully appreciate this problem and all of its consequences," he says. "We deal with it all the time, and we don't have a good tool and everybody's just kind of winging it."

Hack says the HII score has been used in the Rhode Island Hospital ED for four years as well as other centers across the US; he's now developing an HII app for mobile devices that health care centers can integrate with their EHRs. The chance to improve care for underserved patients drew Hack to emergency medicine, he says, and those who are chronically intoxicated are among the most vulnerable. "I feel really strongly," he adds, "that to the extent that we can care for them, that we do it well." **—PH**

FROM THE COLLECTION

Mother's Little Helpers

"Breast is best": we've known this for ages. And as medicine modernized in the 18th and 19th centuries, well-meaning inventors wanted to help nursing moms feed their babies.

The metal nipple shield, top, circa 1774, was designed for women who had trouble breastfeeding, and to contain leaking milk. While the intention was noble, many shields from that time (including this one) were made of lead—which experts already knew could cause nerve and brain damage.

The turtle-shaped Globe Nurser, bottom, dates to the 1890s. It's a relatively simple tool: the flattened glass bottle was made to lie on its side as the infant drank milk through a rubber tube with a nipple on the end. The catch? Bacteria would often build up in the tube, sickening children.

Both items are part of the Rhode Island Medical Society Collection donated to the John Hay Library, Special Collections. **—AN**

PHOTOGRAPHY: ERIK GOULD

IN VIVO

LISTEN AND LEARN

Julie Roth ’99 MD’04 RES’05 F’09 built her career in the relatively new field of women’s neurology, treating patients who were pregnant or had neurological symptoms unique to women. As the associate professor of neurology and of medical science collaborated with ob/gyn colleagues on rare, but scary, cases of neurological diseases in pregnant patients, Roth realized that “ob/gyns are not taught about the brain and the nervous system, and neurologists are not taught about ob/gyn.” She wanted to help trainees bridge that gap, but decided against writing a textbook: “that’s not how our residents are learning.” So she learned to podcast. On Neurostories.com, she’s published a curriculum pairing approachable, 15- to 20-minute audio stories with written case studies on conditions in pregnancy like stroke, epilepsy, and MS. Roth found that residents learned equally well from the written and podcast versions, and the latter “was the preferred way to learn.” Now she’s a “major podcasting advocate,” she says, “because if you know something and you’re the only person who knows that thing, how are you going to get that message out there?” —PH

THE PUSH
The podcast’s title evokes childbirth and the push doctors need to study its content: “You don’t want to learn about it—until you really need to know about it.”

SPEAKING UP
Patients who’ve struggled to get treatment are eager to tell their stories on The Push. “They’re on a mission,” Roth says. “They want people to learn.”

LEARNING CURVE
It took Roth “probably 40 hours” to edit her first episode; her latest took about 10. Now she’s co-teaching a podcasting class for med students.

BACKGROUND NOISE
When Roth’s three kids get rowdy, it drives her crazy—but it makes great audio. She’s recorded their shouts and laughter to tell patient stories.

ON THE AIR
During undergrad, Roth was a late-night DJ on WBRU. “I didn’t like the talking,” she says. “I’d play a 25-minute John Coltrane and sit back.”

BRAIN EXERCISE
Roth plays the bass in the Providence Medical Orchestra, jams with friends, and has even played on the podcast.

PHOTOGRAPHY: DAVID DELPOIO

Argel Martínez, left, accompanies first-year physician José Luis Graciliano García, right, during a home visit with Eufemia Aranda Muñoz, a patient of Partners In Health being treated for tuberculosis in rural Chiapas.

Walk with Me

In rural Mexico, physicians take care of the whole person, not just their illness.

BY CHELSEA GRAHAM RES'18 F'19, DO

Doctor, doctor! She is having an attack again. She can't breathe! She can't breathe! Come to the clinic quickly!" Argel Martínez, MD, opened the door of his humble two-room home in Chiapas, Mexico, and hurried after the family to the clinic, although it was late: already around 9 p.m. When I arrived just after, there was a young woman named Mariana (not her real name) lying on the exam table, hyperventilating and shaking intensely. The electricity in the community was out; we used a headlamp for lighting. Argel laid his hands on her sternum. He knew she was having an anxiety attack, and he knew what his treatment plan would be. It was his close relationship with the patient and her family that allowed him to make a quick diagnosis and respond appropriately.

In the hospital settings that I'm used to, this patient likely would have undergone an expensive workup (labs, EKG, imaging studies) and been medicated, with little individual attention. However, Argel was living in Plan de la Libertad for a year, and

PHOTOGRAPHY: MARY SCHAAD/PARTNERS IN HEALTH

had become a part of the tiny Chiapas community. He saw not only its various cases of illness and injury but, more importantly, he saw each case as a part of an individual person's lived experience. He didn't simply medicate Mariana with an anxiolytic and move on to the next patient, as emergency rooms often pressure clinicians to do. Instead, with human touch, reassurance, and connection, he guided her through deep breathing and relaxation techniques for over an hour until she was breathing calmly. He assured her and her family that if there was anything else they needed, he was there for them.

In Mexico, all first-year clinicians complete an obligatory year of social service, or *pasantía*. Argel had chosen to do his in Chiapas because he wanted to be part of something bigger, though he didn't yet have a name for what that was. While his medical school had trained him to diagnose and take care of diseases, they did not teach him how to take care of the whole person *with* that illness. He had never heard about social medicine or global health until he discovered Compañeros En Salud (CES), as Partners In Health is known in Mexico.

CES has had a reputation for providing quality primary care to patients, as well as support for its providers, since 2011. Placement in a rural clinic in Mexico is usually dreaded by young *pasantes* due to multiple structural problems including lack of resources, exposure to violence, poorly stocked clinic pharmacies, and the lack of a feasible way to refer patients into specialized care. *Pasantes* in rural areas usually do not have the opportunity to work in team-based settings, and do not have help from community health workers either. At CES, it's the opposite. Argel knew he would not be alone. As he cared for patients like Mariana with more complex cases, he would have the support of CES's auxiliary programs that complement the primary care he provided: maternal health care, referrals, and, in Mariana's case, a mental health program, whose team guided her care and provided him with ongoing education.

A HUMAN RIGHT

As a second-year family medicine resident in 2017, I worked with Argel in Plan de la Libertad for one month. I supervised him in clinic and helped him expand his differential diagnosis skills. It was clear that he had an excellent foundation of knowledge, so my job was to challenge him beyond the basics. For the most part, we treated chronic diseases (such as diabetes and hypertension) and acute illness (like diarrhea) in the same way as we do in the US. He was practicing evidenced-based medicine in one of the most remote areas of Mexico. The medications available to him, thanks to CES, are similar to the ones that I have for many of my patients in the United States. When people asked, "What is it like in Chiapas?" I would tell them that my work in CES-supported clinics is similar to my work in Rhode Island in that we do the best with what we have to provide quality primary care to every patient regardless of race, class, gender, or documentation status. Argel and I shared a lot of commonalities, and we both live by Partners In Health's belief that health care is a human right.

With human touch, reassurance, and connection, he guided her through deep breathing and relaxation techniques for over an hour until she was breathing calmly.

A year later, I came back to Chiapas as a global health fellow to help create and implement a family planning curriculum with the CES maternal health team. Working with Argel as a mentor had motivated me to become a better teacher. Argel had returned to CES, too. He's now a clinical supervisor for three CES *pasantes* in the rural communities where they live and work. He helps troubleshoot complex cases, provides direct supervision in clinic as a mentor, and facilitates referrals for patients needing specialized care.

When Argel first came to Chiapas, he didn't have a word to describe what he wanted to be as a physician. Now he does: *acompañate*. It doesn't quite have an English equivalent. We use *acompañates* to describe the community health workers at CES, who truly walk side-by-side with our patients, who build relationships with them and their families. Argel knows he wants to always be there for patients like Mariana, for the young physicians he supervises, and for his colleagues. He wants to be their *acompañate*.

CHELSEA GRAHAM is a global health fellow in the Department of Family Medicine. She works at Thundermist Health Center in West Warwick. She will continue to work for Partners In Health when she returns to Chiapas in May. Her work focuses on family planning and contraceptive counseling.

Learning without Walls

Volunteering in the community helps future physicians connect more deeply with patients—and themselves.

BY AMELIA B. WARSHAW MD'21

Armed with plastic fruits and vegetables, a stethoscope, toy syringes, and boxes of Band-Aids, a half dozen classmates and I walked into a Pawtucket, RI, preschool classroom ready to teach kids about health and wellness. Using stuffed teddy bears as our patients, we discussed many topics, including germs, nutrition, and exercise. Even more important, we got to hear directly from the 3-, 4-, and 5-year-olds about their fears of seeing doctors and their excitement about being healthy.

This and other community-based experiences—all part of a new service learning initiative at the Warren Alpert Medical School—are as vital to my understanding of what it means to be a physician as learning to listen to heart sounds, treat injuries, or interpret X-rays.

Service learning, which integrates community service with traditional curricula, enables students to apply classroom lessons to the real-world needs of local communities. It also includes time for personal reflection, which can fortify a commitment to service and may even help prevent burnout. But perhaps above all, service learning allows medical students to connect with underserved communities in ways that can last a lifetime.

Research backs up the value of service learning. According to a 2014 analysis of 18 studies, service learning strengthens university-community relationships and improves students' communication, collaboration, clinical skills, and cognitive-emotional development. What's more, the Liaison Committee on Medical Education, the accrediting body for MD-granting programs in the US, recognizes this pedagogical approach with a specific standard on service learning.

Yet not many medical schools adopt service learning. In 2015, only 25 percent of participants in the AAMC Curriculum Inventory reported offering service learning or some other form of community service. Given the many benefits of experiential learning—and academic medicine's increasing focus on community engagement—schools should explore ways to offer or increase service learning opportunities for their students.

The Warren Alpert Medical School unveiled its Service-Learning Project in 2018 as part of its Doctoring course, allowing second-year students to fulfill certain requirements through volunteer experiences. Previously, the community-based component of the course was limited to working in hospitals, physician groups, or private practices.

Wondering what inspired this change, I asked the assistant director of the Doctoring program, Julia Noguchi, MPH, who explained that the impetus came from students who felt a lack in the curriculum. "As one student put it," she said, "'I've practiced the cardiopulmonary exam dozens of times, but still feel like I have a lot to learn about treating LGBTQ+ patients.' Students told us they wanted more opportunities to learn how to be competent providers for all patients."

Noguchi's reply harkens back to the Medical School's mission: "the pursuit of health to benefit society." It also reminds me why I chose Brown: my desire to attend a school that views health as a community effort and sees physicians as public servants.

COMMUNITY CONNECTIONS

In Providence, nearly 13 percent of families live below the poverty line. When it came time for me to pick my service learning project, I had my choice of more than 40 diverse organizations, ranging from those that help homeless or incarcerated individuals to one that teaches parents how to prevent childhood lead poisoning.

In addition to my stint at the preschool, I also opted to teach sex education classes in a Rhode Island middle school. But one of my most powerful experiences occurred while volunteering at the Ronald McDonald House of Providence, which provides lodging to families of children receiving treatment at local hospitals.

The facility had an intimacy that I hadn't anticipated. My fellow students and I were walking into what had become the home of families going through an unimaginably difficult period. As we treated the families to warm food and smiling faces, the act of serving pasta and tomato sauce—a common meal for many

medical students—took on a whole new meaning. That experience and similar ones have taught me that simple acts of kindness, careful listening, and direct outreach contribute immeasurably to the wellness of patients and of the wider community.

In fact, I was so struck by my experience that I wanted to know whether other students also viewed service learning as indispensable to their education.

I talked with several classmates who worked with the nonprofit Higher Ground International, educating West African immigrants about dental hygiene and mental health. One, Cleo Rochat MD'21, considered the project one of her most important experiences as a medical student. "Teaching the women at Higher Ground was an opportunity to engage with and learn from the refugee community," she said. "I was struck by the closeness and strength of the community and how eager they were to access health resources and help their community to do the same."

Godwin Boaful '16 MD'21 echoed Rochat's thoughts. "It was an exceptionally enriching experience to share information with [patients], but more importantly, to hear their own experiences," he said. "It was equally rewarding to hear their advice on how to be better physicians." That advice, he explained, stressed the importance of physicians focusing on patients' concerns, rather than their own priorities.

Thanks to my service learning experience, I'm focused on becoming a doctor who goes above and beyond for my patients. I'm learning to be a doctor who thinks about the community in which my patients work, live, and play, one who focuses on how the biggest components of health and wellness are outside the four walls of the hospital. I am determined to be a physician who pursues health to benefit both my local community and all of society.

AMELIA B. WARSHAW has worked at The Daily Beast, NYU-Langone's Doctor Radio, and the Pulitzer Center on Crisis Reporting. This article first appeared on *AAMCNews*.

ILLUSTRATION: MICHAEL AUSTIN

Ryan McTaggart, left, and Mahesh Jayaraman say mechanical thrombectomy is so effective it allows some stroke patients to go home the next day.

Second Chance

BY JEN A. MILLER
PHOTOGRAPHY BY JESSE BURKE

Two Brown professors have perfected a treatment for the most severe kinds of strokes. Now they're working to change the way stroke patients are triaged so they can get the procedure as quickly as possible.

ON SEPT. 3, 2018, Lori Camara had a stroke. After her husband called 911, she was rushed by ambulance to the nearest hospital.

This may seem like the most logical thing to do. A patient is in distress, take her to the closest place she can get care—except that hospital couldn't give her the care she needed. That's because Camara, 53, was having an emergent large vessel occlusion (ELVO) stroke, a serious type of stroke that comes with high rates of incapacitation, morbidity, and mortality.

Fortunately, the hospital knew to obtain a CT angiogram, a scan that images blood vessels and tissues. It showed that she was in dire shape, so she was rushed to Rhode Island Hospital for a mechanical thrombectomy, a procedure that removed the clot blocking blood flow to her brain.

Two days later, she was discharged. "I'm a miracle. I'm very blessed," she says from her home in Westport, MA, in February.

Until recently, the outcome of such cases has been bleak. Overall, stroke is the fifth leading cause of death in the US, killing about 142,000 people per year, according to the American Heart Association, and 5.5 million people worldwide. Stroke is also the leading cause of long-term disability in the US. A lot of that damage is done by ELVO strokes. Even though ELVOs only cause about a third of acute ischemic strokes, they are responsible

Lori Camara expects to return to her job teaching seventh grade after surviving a major stroke.

for three-fifths of dependency and more than nine-tenths of stroke deaths.

If blood flow can be restored, though, patients are more likely to avoid such a fate. For Camara, that meant instead of being in a nursing home or worse, she could talk on the phone about her experience while waiting for her sister to pick her up for a girls' weekend, five months after she left the hospital.

"I can't believe I've recovered to the extent that I have," she says.

DRAMATIC RESULTS

Strokes come in two different forms: hemorrhagic, caused by bleeding; and ischemic, caused by a clot or narrowing of an artery.

In ELVO strokes, the arteries involved "feed a large part of the brain, and it's oftentimes the tissue in those areas that control things like movement for half of the body, vision, and language," says Karen L. Furie '87 MD'90 RES'94 F'95, P'19MD'23, MPH, the Samuel I. Kennison, MD, and Bertha S. Kennison Professor of Clinical Neuroscience and chair of the Warren Alpert Medical School's Department of Neurology.

With the brain starved of nutrients and oxygen, "these patients were often devastated. They'd be institutionalized, unable to swallow, unable to care for themselves," she says.

Right now, only about 3 percent of ischemic stroke patients are treated with tissue plasminogen activator (tPA), a clot-busting medication that typically works well for small clots. But, says Mahesh V. Jayaraman '94 MD'98 RES'03, director of the Neurovascular Center at Rhode Island Hospital (RIH) and associate professor of diagnostic imaging, of neurology, and of neurosurgery, it doesn't have a significant effect on large blockages. Patients with severe strokes have about a 25 percent chance of having a good outcome if tPA is administered in the first hour after symptoms present.

That's where mechanical thrombectomy comes in. The technique was refined by Jayaraman and Ryan A. McTaggart RES'10, MD, director of interventional neuroradiology at RIH and an associate professor of diagnostic imaging, of neurology, and of neurosurgery.

The procedure seems relatively simple: Using fluoroscopy—a continuous X-ray—a neurointerventionalist snakes a catheter from an artery in the upper leg to the brain and then deploys a stent retriever within the clot to snare it and pull it out.

The process takes under an hour, is minimally invasive, and patients sometimes go home the next day. Camara went home after two days because her treatment also involved repairing a dissection (or tear) of her carotid artery.

Mechanical thrombectomy has been wildly successful. In 2015, five randomized trials "all reached the same conclusion, and that is that the modern thrombectomy devices dramatically improve the likelihood of a good outcome compared with medical therapy alone," Jayaraman says.

"It's like a blocked pipe. You can restore flow and prevent the brain from dying," Furie says. "It's a very effective way of rapidly restoring blood flow."

Camara is an example of the astounding treatment effect. After undergoing subsequent physical therapy and speech therapy, she says that the lingering side effects are minimal compared to what they could have been, and she plans to return to her job teaching seventh-grade students in the near future.

Going from not being able to do anything to doing something—with such proven results—is not just uncommon but extraordinary, says Jayaraman.

"It's one of the most profound treatment effects in all of medicine," he says. "You rarely get a flip-of-the-switch moment where you go from no evidence supporting a treatment to dramatic evidence showing superior outcomes."

TIME IS TISSUE

As astounding as the results of mechanical thrombectomy have been, getting patients to the interventional suite as fast as possible to get the procedure is critical for it to work. The chance for a good outcome drops 15 percent for every hour the procedure is delayed. Every minute counts, Jayaraman says, because "if you save a minute, you save the patient a week of independent life."

"When we restore blood flow quickly we not only reduce disability but we can also save downstream health care costs. Every minute faster we open that vessel, we save the health care system more than $1,000—each *minute* faster!" McTaggart adds.

In order to save those minutes, patients need to be taken as soon as possible to a comprehensive stroke center where a mechanical thrombectomy can be done—there are 175 such centers in the US—and not to a primary stroke center.

Confusing the two is easy, especially when there are more than 1,000 primary stroke centers in the country. They have 24/7 CT and MRI capabilities and can give patients tPA, but they are not required to be able to perform mechanical thrombectomy to receive their primary stroke care center designation.

"For the first time in medicine, we have a unique problem. You have a highly effective treatment—if the patient gets it," Jayaraman says. According to a 2017 poll, 33.8 percent of EMS providers said they most frequently took stroke patients to the nearest hospital.

Making changes to stroke systems of care in order to get patients with ELVO strokes to a comprehensive stroke center as soon as possible has required a rethinking, from start to finish, of how stroke patients are evaluated and how long it takes them to get into the neurointerventional suite.

"What we need to do is transform the systems of care so that patients have early access to this lifesaving surgery," McTaggart says.

That's why he and Jayaraman have become evangelists for the importance of identifying ELVO strokes and getting those patients to comprehensive stroke centers, doing everything from lobbying local governments to change medical protocols to McTaggart naming his Twitter account @mobilestroke4U. Using the hashtag #leavenoELVObehind he tweets about the need to change stroke care delivery and champions mobile stroke unit technology.

There is precedent for this kind of protocol change, McTaggart says. He points out that someone with chest pain is given an electrocardiogram (ECG) to detect STEMIs (the most severe heart attack) and those patients are triaged directly to centers that offer interventional cardiology, and that people in rollover car crashes are sent to Level 1 trauma centers by default.

"But the world has lagged on understanding that in two minutes you can do a CT angiogram [CTA] that will confirm or exclude the worst possible stroke a patient can have," he says. "CTA is to ELVO what ECG is to STEMI."

Their work, of course, started in Rhode Island, which in 2015 became the first state to triage stroke patients directly in the field. In 2017, the Rhode Island Department of Health changed the statewide Emergency Medical Service protocols so that patients with suspected ELVO strokes are sent directly to the closest comprehensive stroke center (right now Rhode Island Hospital is the only one in the state). Similar protocols have since been put in place in other states.

McTaggart has taken a hands-on approach to make sure those who can make a difference understand the importance of these changes, why they happened, and what they can do to get patients into the right care faster, and then put them into practice.

"Legislation and regulation doesn't always translate into behavior, so we're trying to change behavior by literally going to every single fire station in the state and educating them on what an ELVO stroke is, what the mechanical thrombectomy is, and teach them how to recognize patients with severe stroke," he says.

That includes teaching emergency professionals how to use the Los Angeles Motor Scale (LAMS) score, which evaluates things like facial droop, arm lift, and grip strength. Patients rated four or five, on the one-to-five scale, should immediately be sent to a comprehensive stroke center. McTaggart also has them simulate calls about their patients, making sure they're conveying appropriate information, like when the patient was last seen well, their

> "You rarely get a flip-of-the-switch moment where you go from no evidence supporting a treatment to dramatic evidence showing superior outcomes."

LAMS score, if they're on anticoagulants, their blood pressure, date of birth. For this work, McTaggart received the Rhode Island Hospital Service to Community Award last year.

They've collaborated with primary stroke centers to identify those with ELVO stroke who come to their hospitals first, which resulted in cutting 40 minutes off the median time to get a patient from a primary stroke center to RIH.

"Mahesh and I felt a responsibility to work with all our partner hospitals to enable them to better make this diagnosis and improve their efficiency so people wouldn't suffer unnecessary death and disability," McTaggart says. "The only thing more frustrating than missing the diagnosis entirely is witnessing a prolonged interfacility transfer so that the brain is dead by the time they get to us."

Such efforts most likely saved Camara's life when she was first taken to the hospital closest to her home. That hospital executed the primary stroke center ELVO protocol: they performed a CT angiogram as soon as she arrived, which showed an ELVO stroke, and she was rushed to RIH, where she immediately underwent a mechanical thrombectomy.

"She would have been neurologically devastated or probably dead had she not gotten here to have the procedure," McTaggart says. "Rather than 40 years of living in a nursing home, she's going to be back to work and doing everything she did before this happened."

WHAT'S NEXT

While the mechanical thrombectomy has consistently improved outcomes for ELVO strokes, Jayaraman and McTaggart are still working to refine it, improve access, and optimize techniques, such as whether adjuvant medical therapy can improve outcomes.

RIH was the second-highest enrolling site of patients into the DEFUSE 3 trial. The study, published in the *New England Journal of Medicine* last year, showed that physicians should extend the window for treatment of ELVO strokes with mechanical thrombectomy from six hours from the onset of symptoms to 16 and 24 hours. It has also made a major difference for what's known as "wake up" stroke patients, where the time of onset of stroke symptoms is not known. The results "really change the entire philosophy. Time doesn't matter. What matters is what the imaging shows," McTaggart says. If a CT scan shows that the brain tissue hasn't died yet, they're candidates for this procedure. "It can save them from death and disability," he says. "The tissue is the issue."

RIH is also a top enrolling site of patients into the ESCAPE-NA1 clinical study. It's an ongoing phase 3 trial testing the safety and efficacy of using NA-1, a neuroprotectant, along with mechanical thrombectomy, in ELVO stroke patients (Camara is enrolled in this study). It's also assessing whether the use of NA-1 leads to lower rates of needing dependent care, improved neurological function, improved activities of daily living, and lower mortality rates.

The doctors continue to advocate for better field assessment of stroke patients, with two end goals. The first is the creation and deployment of mobile stroke units, which are ambulances outfitted with a CT scanner and telemedicine capabilities, something McTaggart calls the "holy grail of stroke care, where the highest-level expertise is delivered right to your driveway."

"It's a primary stroke center on wheels," Jayaraman says. It would allow EMS to obtain a CT scan and identify ELVO strokes at the point of first interaction with medical personnel, and therefore get them sent to the most appropriate center as soon as possible.

The second goal is legislation in all geographic regions to get every patient, regardless of their location, access to mechanical thrombectomy and the highest level of stroke care. "In major metro areas, that means field triage and bringing patients to the right place the first time," McTaggart says, while more remote areas will rely heavily on protocols and telemedicine so that patients are diagnosed early when they arrive to hospitals and can be rushed to comprehensive stroke centers for the intervention.

At the very least, every hospital should be doing a CT angiogram for every single stroke patient assessed, he says, which is already the standard at Rhode Island Hospital.

"I like to say that stroke is just as devastating as the most severe cancer, but unlike cancer, we have a cure," McTaggart says. "We've taken up this call and we've done all this education and sacrificed our own personal lives and sleep patterns so we can protect patients from something that's now totally reversible." **M@B**

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BY PHOEBE HALL | ILLUSTRATION BY THE BALBUSSO TWINS

TRUE COLORS

The best health care for people who are transgender is much like the best care for *all* people.

DOCTORS HAVE HAD TRANSGENDER PATIENTS as long as doctors have had patients—but they likely didn't know it. Transgender, or trans, is an umbrella term for people who don't identify with the sex they were assigned at birth, and who comprise about 0.6 percent of the US population. Yet their health care needs are disproportionately high, including high rates of psychological distress, homelessness, and physical health problems, from obesity to HIV.

These health disparities are due not only to the discrimination and rejection many transgender and gender-diverse (TGD) people face daily. Often bias and mistreatment follow them into the exam room. According to the 2015 US Transgender Survey, about one-third of respondents had at least one negative experience with a health care provider, and 23 percent didn't seek care for fear of being mistreated. "I have an intense fear of being the patient of many of the people who I respect and work well with," says Ry Garcia-Sampson '12 MPH'19 MD'19, who identifies as nonbinary. "And that speaks to the level of training and education that we need to have."

'IT'S ABOUT RESPECT'

EMILY CLARK OF WARWICK SHARES HER EXPERIENCE AS A TRANS WOMAN AND PATIENT.

I came out three years ago. I was, I guess, on the older side of it—I was 37 when I first started transitioning. And even at that time, there still was not a lot of information, medically. I knew since I was probably 3 or 4 years old that something was off. It was a little tough to look it up in *Encyclopedia Britannica* back then, so I was probably in my late teens before I had any idea what I was dealing with. I just knew I felt comfortable in women's clothing and doing more feminine things. I did get caught as a child on a couple occasions by my parents, and it didn't go well; definitely made me feel a lot of shame.

My wife and I have been together 21 years. Six months to a year into our relationship, I told her that I like to wear women's things. She was able to, over time, see me progress to be more comfortable in my skin and just to see me for me. So when I did eventually break down to her and say that either I need to make a change or I'm not going to live to see my next birthday, she was ready for it. She was very supportive, and she still is. I'll tell you, the moment I came out to her, the amount of weight lifted, from just that one moment, was enormous.

I hadn't gone to doctors previous to transition. It just wasn't something I was comfortable with. I just didn't care about my health. So when I decided it, that's when I jumped online, I started doing research. I looked up doctors who dealt with gender disorder and things in that field and made sure I was going to a safe place. But I've heard many horror stories from other people. I was pushing my wife for years to talk to somebody, and I did finally convince her when I started transitioning. And the first doctor she saw, right in Cranston, Rhode Island, told her that I lied to her and that she should divorce me. My wife found a more understanding therapist after that.

That goes for clinicians at all stages of their career, adds Professor of Pediatrics Michelle Forcier '87, MD, MPH, a nationally recognized expert on gender and sexual health. "We still hear at times, 'I'm not going to take care of that patient.' … 'I can't get behind transgender health care,'" says Forcier, the director of the Lifespan Gender and Sexual Health Program. But the stakes of ignorance, willful or not, couldn't be higher. "The worst outcome is not being transgender," she says. "The worst outcome is being so invisible or stigmatized that a patient ends up being depressed, anxious, nonfunctional, or dead."

That's why teaching medical students to care for LGBTQ+ patients is imperative. And this year the Warren Alpert Medical School became one of the first in the country to require it, by adapting Rainbow Caduceus—which was first developed by students in 2012 as an optional, one-night training—into the Doctoring curriculum. The school also has integrated training beyond specific lessons, such as using gay and gender-diverse patients in case studies, and evaluating how students ask patients their preferred pronouns and take a sexual history in the OSCEs.

I like that I'm hearing more doctor's offices are introducing paperwork that will allow a patient to put their legal name, and their name and gender that they identify with. It takes away that nervousness and anxiety of having to tell the doctor, which is really good. I can tell you from personal experience that using the wrong pronoun is literally like a dagger to the heart. It truly kills you. I still remember the very first time I got ma'amed. It was at Dunkin' Donuts. I'll never forget it because it was such a huge deal for me.

Honestly, it's just about respect. We don't want somebody coming in and doing anything extra or trying too hard. Just treat us like everybody else.

Importantly, students are hearing about trans patients outside of lectures on endocrinology or STDs. "The more that we can incorporate sexual and gender minority care into other curricula, the more it will normalize this care, and students will be able to learn about it across the boundaries of specialization," says Alexis Drutchas RES'15, MD, a physician at Fenway Health who cofounded the Rhode Island Trans Health Conference, now in its fifth year, during her family medicine residency.

The bottom line is, trans care is patient care. Though some trans patients do seek hormone therapy and gender-affirming surgery, most go to the doctor for the same reasons any patient would: a stomach bug, a flu shot, a broken arm. Anyone who can respectfully communicate with and treat a patient can help a trans patient. "It goes beyond the LGBTQ population," Doctoring course leader Dana Chofay RES'98, MD, says. "An approach that is open-minded, nonjudgmental, pausing and listening, following your patient's lead … regardless of the patient you're caring for, it's going to help you be the best doctor possible."

ORIGIN STORY

Faculty, students, and alumni talk about how Rainbow Caduceus grew from an optional, student-led training to an official part of the Doctoring curriculum. *Some interviews have been edited for length and clarity.*

Becca Raymond-Kolker: The reason it's called Rainbow Caduceus is at the end of the training, everyone received a Rainbow Caduceus pin to wear on their white coat.

Hannah Janeway: To be able to visually display to patients, "I'm a person who cares, is an ally, and I'm open to listening to you." But I wanted to make sure that if people were wearing these pins, they actually were open and accepting and knew how to deal with LGBTQ patients. So we decided to design this curriculum, and if you completed the curriculum, you would get the pin. And that's how the idea evolved.

Fadya El Rayess: Sometimes medical students are the first point of contact for patients in the health care system. By having patient-centered conversations and demonstrating openness to working with LGBTQ patients, they might make their experience in medicine better.

Jon Thorndike: Hannah did most of the brainstorming in terms of what should be part of it. And then we brought in Fadya El Rayess and a bunch of other residents and faculty to come facilitate during the session.

PARTICIPANTS

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Jonathan Thorndike
MD'15 RES'19
Emergency medicine resident
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El Rayess: I'm not sure how I came to be that person who did it. I think any one of us could have done it. The concepts aren't really earth-shattering. The students sent me the PowerPoint that they wanted, and I worked with them to make their goals achievable in the time frame that they had.

Janeway: We wanted it to be interactive, because a lot of times people just talk at you, and it's not really all that helpful.

El Rayess: One activity was to have complicated conversations around helping students identify some of their implicit biases. Another exercise was to practice the language of interviewing, to practice what can be awkward conversations with each other, so that by the time they're working with an actual patient, it's a little more fluid.

Janeway: We mostly advertised it to first- and second-years. You usually get around 20 people, but approximately 70 people came to the first one. However the people who are going to come to these lectures are going to self-select. The goal was always that this should be a required part of the curriculum. When you're trying to make a difference and you really believe strongly in something, it was really frustrating that that didn't happen right away.

Paul George: Unfortunately, change is slow, but change eventually hits a tipping point, and then things happen. I was thrilled when Dr. Rougas said that he was going to include it in the Doctoring curriculum as a required component this year.

Steve Rougas: It clearly was filling a gap in our curriculum. We were able to sit down and say, how can it fit into our existing course structure? How can we make sure that it's a high-quality program that fits with our course objectives, but also meets the needs for the entire student body? Rainbow Caduceus has been a great, stellar example of that process.

Thorndike: I think it's a testament to Hannah Janeway's brilliance in coordinating people and pushing the social progression forward.

Janeway: That was one hard piece of work. But another hard piece of work was setting up something that would continue to grow, and empowering people to change it and implement it in new ways. This was totally a group effort from the very beginning.

Raymond-Kolker: The generations of Spectrum have come up with this training. But it's really been a great collaboration with the Doctoring faculty, Spectrum leadership, and Joanna Georgakas, who, as part of her scholarly concentration in Med Ed, helped take Rainbow Caduceus as an optional training that Spectrum ran and seamlessly integrate it into the Doctoring curriculum.

A LIFE-CHANGING CAREER

Gender-affirming surgery—which alters someone's outward appearance to more closely resemble their gender identity—is on the rise in the US. One-quarter of respondents to the 2015 US Transgender Survey said they'd had at least one procedure, such as chest reconstruction (known as top surgery), facial feminization, hysterectomy, or genital surgery (bottom surgery). The authors of a 2018 study in *JAMA Surgery* predicted the number of surgeries will continue to increase alongside the expansion of insurance coverage.

Not every transgender person wants to undergo surgery. Aside from the considerable expense and personal preference, some patients are deterred by the complications of certain procedures. "The biggest commitment is the female-to-male bottom surgery, because the complication rates are a lot higher," says Daniel Kwan, MD, clinical assistant professor of surgery. "It's a more involved surgery."

Kwan says he was "lucky" to experience transgender care during his residency and fellowship, at the University of Chicago, but such training isn't standard across US plastic surgery programs. As the division chief of reconstructive surgery for the Lifespan Physician Group, he says about half of his practice is gender-affirming surgeries, mostly facial feminization and top surgeries, while "vaginoplasty has been growing quite steadily."

Plastic surgeon Alexes Hazen '87 MD'96, P'18, has built a busy practice around transgender care. Her first trans patient, 10 years ago, was referred to her for a mastectomy and chest reconstruction. "The patient was, like, how many of these have you done? And I was, like, zero. I've done exactly zero," Hazen recalls in a phone interview. "I had no education in it." Hazen read whatever papers she could find on how to do the procedure—"fortunately, it's not that complicated"—and gained the patient's trust.

The surgery changed both their lives. When Hazen had to examine the patient, who had a beard and bound his chest, he was "so embarrassed and shy" he didn't want to take his shirt off, Hazen says. It was "really, really uncomfortable." But post-op "he's literally lying on the hospital bed, with no shirt on," she says. "I was like, wow. He's that comfortable. I mean, just a different person." She started learning everything she could, and her reputation grew in the trans community. She's perfected her techniques, and developed new ones; she recently published her technique to create a nipple in *Plastic and Reconstructive Surgery*. A clinical associate professor of plastic surgery at NYU, Hazen also trains residents and mentors interested med students. "It's become a very, very important part of my life."

> **"I was like, wow. He's that comfortable. I mean, just a different person."**

Urologist Geolani Dy '08 MD'12 wanted to be an advocate for trans patients but never thought she'd get to care for them surgically. Though her residency at the University of Washington offered no surgical training in gender-affirming procedures, she did get support to seek it out elsewhere, and furthered her education in trans health and bottom surgery with a fellowship at NYU. Helping patients through the long and arduous surgical process is "gratifying," Dy says, but she cautions that they face "challenges that surgery alone will not address. We need to be mindful of that, and think about transgender health as a holistic, lifelong continuum of care."

Dy, who will join Oregon Health & Science University's Transgender Health Program this summer, has found additional satisfaction as an educator. She co-created a trans health curriculum for urology residents that's now part of the American Urological Association core curriculum. "A lot of it is just understanding what transgender and gender nonbinary are, understanding appropriate pronouns, and how to make patients feel more comfortable when seeking urologic care," Dy says. "And then, of course, it goes into the basics of what a vaginoplasty, phalloplasty, or metoidioplasty might entail, and how to identify and manage complications." The training meets a growing demand: as more insurers cover surgery, she says, "surgeons are recognizing that these are services that we as a community are ill-equipped to provide."

Joanna Georgakas: A lot of it just meant getting the right people in the room together. We already had a model to run off of. The students already like this. It's already proven. Had that not already been a part of what people were doing at Brown, it would have been a lot harder to make that transition to being part of the formal curriculum. I thought faculty and administration buy-in was going to be the hardest part. But honestly Brown is a really special place. We don't realize how lucky we are to have an administration that cares so much about how we feel about the curriculum.

Raymond-Kolker: We didn't change the curriculum a ton this year. The cases stayed the same as 2017. The big difference was the speakers. Dr. Rougas and Dr. Chofay said, we need to make this more intentional, engaged learning. What I advocated strongly for was to have someone who is both a provider and can also speak to his experience of being a patient giving the keynote. Centering the voices of patients felt important to me.

Adrian Chiem: The keynote was followed up by case discussions in smaller groups, facilitated by smart facilitators who come from the community who do work with an LGBTQ population. There are so many health care providers in Providence who do really good work.

Raymond-Kolker: Dr. Rougas and Dr. Chofay also facilitated giving all of the Doctoring small group faculty a separate training. That was an ask that Spectrum had. They're doing a great job of taking this faculty development seriously.

Chiem: At the end of the day, we have many more physicians who are coming out just a little bit more educated about these topics, which is amazing.

Dana Chofay: Obviously, the goal is training students to be the best practitioners and caregivers possible. But I always tell them that, as faculty, we're lifelong learners. We're always adding in new skills. The feedback that we got immediately, from students and faculty alike, was so rewarding and so validating.

CONTINUING EDUCATION

"You're going to have a transgender patient. It's not a matter of if, it's a matter of when, regardless of what specialty," says social worker Jill Wagner, LCSW, who works with trans youth and their families at the Lifespan Adolescent Healthcare Center. Treating them doesn't require specialized knowledge, she adds. "The hormones are kind of the easy part of care. The harder part is learning how to talk to your patients and build safety and rapport with them."

Every provider needs "trans 101," as Chelsea Graham RES'18 F'19, DO, puts it: "know how to use a patient's asserted name, asserted gender, pronouns, et cetera." Graham co-leads the gender clinic at the Family Care Center in Pawtucket, where she trains family medicine residents to care for TGD patients. That includes avoiding medical voyeurism. "People ask questions [of TGD patients] that are not related to the chief complaint," she says. "Yes, you're going to take a surgical history, you're going to take a medication history. But you need to ask what's pertinent to that patient's care."

Many professional societies offer webinars and other resources that are readily available to any practitioner. Several have published policy statements advocating equal access and affirmative care, including last year's statement by the American Academy of Pediatrics, which was written by Jason Rafferty RES'17, MD, MPH, MEd, who treats youth in the Lifespan Gender and Sexual Health Program.

The policy statement "gives pediatric practitioners more ground to stand up and say: trans health is important. Understanding the concept of gender diversity is important. Whether you are trans or not, gender is a part of everyone's identity that is revealed throughout development," says Rafferty, a clinical assistant professor of psychiatry and human behavior. "Those messages now are more official."

"That said," adds Michelle Forcier '87, MD, MPH, a professor of pediatrics, "policy means nothing if we don't work hard to initiate, implement, integrate major changes in our infrastructure." That includes electronic health records with spaces for legal and preferred name and gender identity,

> **"At the end of the day, we have many more physicians who are coming out just a little bit more educated about these topics."**

Georgakas: It definitely can be improved next year. I want to make sure that it's something that's sustainable.

Rougas: The onus becomes on us to figure out what's the best way to make it work, not that the student has to be the sole voice bringing these issues to light.

Chofay: Yes, absolutely. But that's what makes our job most fulfilling, is that we are able to take these brilliant minds and nurture their passions and have a product where the community as a whole benefits from it.

Janeway: I'm just really proud of everyone who came after me. I'm sure the curriculum is even better now than it ever was. And the fact that they were able to get it to be a required curriculum—that's amazing. Now everyone has to be exposed to it whether they want to be or not. [LAUGHTER] **M@B**

gender-neutral restrooms, adequate insurance coverage, and more.

"You have to have the staff on board; it can't just be you," adds psychiatrist Agnieszka Janicka '05 RES'14, MD, the director of the Lifespan Adult Gender and Sexuality Behavioral Health Program. "Because the first experience that a person gets when they call is the secretary, and if that doesn't go well, then they might not come in through the door. This is a very tight-knit population. A lot of my patients come from referrals. They don't want to pick a provider out of the Yellow Pages."

LGBTQ-friendly providers can get their names out through networking and listservs, like the New England Gender C.A.R.E. Consortium. But no one person can, or should, have all the answers. "We've really tried to emphasize the importance of teamwork and collaboration," Rafferty says. "A lot of areas of the country, people are on their own." But by sharing expertise, individual providers can become part of "a comprehensive and interdisciplinary system."

Adds Fadya El Rayess, MD, MPH, director of Brown's family medicine residency: "We are much more connected than we used to be. When we have a question about a hormone or how to interpret labs, Michelle Forcier is a text away."

RESOURCES

- **The Fenway Institute** fenwayhealth.org/the-fenway-institute
- **UCSF Center of Excellence for Transgender Health** transhealth.ucsf.edu
- **World Professional Association for Transgender Health** www.wpath.org
- **TGI Network of Rhode Island** www.tginetwork.org
- **AAMC Sexual and Gender Minority Health Resources** www.aamc.org/initiatives/diversity/lgbthealthresources

Providers can learn more and network at trans health and wellness conferences that take place across the country, including Rhode Island, Philadelphia, San Francisco, and Washington, DC.

BY ANEEQAH NAEEM ’20 MD’24
PORTRAITS BY ADAM MASTOON

Oh, Pioneers!

The inaugural class of the Primary Care-Population Medicine program brings a system-wide perspective to patient care.

FOUR YEARS AGO, the first class of a unique, dual-degree program that integrates traditional medical education with an intensive study of the US health care system walked through the Van Wickle Gates. Now those students are ready to graduate and begin residency.

The Primary Care-Population Medicine program, the first of its kind in the nation, was developed to train med students not only to care for patients, but to consider the health of their entire patient population. They conduct thesis research and take leadership training, and after four years earn both an MD and an ScM in population medicine. The program was initially supported by a $1 million grant from the American Medical Association’s Accelerating Change in Medical Education Consortium, a collaboration among 32 medical schools to change physician training for the health systems of the 21st century.

“I knew I wanted to find a medical school … that valued that physicians are part of a broader health care system and the physician’s role in reshaping the health care system,” Jon Staloff ’14 ScM’19 MD’19 says. He was originally planning to apply to MD-MPH programs, but when he found out about PC-PM, “it just felt right.”

The Longitudinal Integrated Clerkship (LIC) sets the program apart from the typical third-year curriculum. PC-PM students spend half a day per week for several months with a physician mentor, while also following a panel of 30 patients through various health care settings to gain a feel for the patient experience and learn to advocate for patient needs. Students say getting out of the hospital and into various outpatient settings helped them build meaningful, long-term relationships with both faculty and patients.

Of the 15 students in this pioneering cohort, nine chose primary care specialties; others will bring their population medicine training to specialties such as anesthesiology, emergency medicine, surgery, and obstetrics and gynecology. **M@B**

HOMETOWN
Boston, MA

UNDERGRAD
Columbia University

MED SCHOOL
Warren Alpert Medical School

RESIDENCY
Massachusetts General Hospital/ Harvard Medical School

PROGRAM
Internal Medicine-Primary Care

Michelle Diop ScM'19 MD'19

Diop wants to change the field of palliative and hospice care.

"My goal is to reexamine how we address suffering, death, and dying. My hope is to effect change from the individual to global level," she says. "We need to help people think about quality of life and what it means to them earlier in the care process."

Her interests first developed at Columbia, where Diop majored in anthropology with a focus on the experience of human suffering. During an internship in 2011, she rounded with a palliative care team. "We spoke to a man who was dying from lung cancer. He was crying, telling us that he wasn't ready to die. It was probably one of the lowest moments of his life. The social worker just grabbed his hand and said, 'We're here for you,'" she says. "I felt the power of being present by the bedside, and I knew that's what I wanted to do with my life."

The PC-PM program helped further Diop's passion for primary care and palliative care through research and the outpatient emphasis of the LIC. The long-term relationships with faculty like her thesis mentor, Professor of Medicine James Rudolph, MD, and peers—her "family within a family"—helped her develop her career goals while maintaining a sense of life balance.

"The PC-PM program helps you stay focused and sustained throughout med school," she says. "It makes you the best doctor you can be so you can make a big, meaningful impact throughout medical school and beyond."

Julia Solomon ScM'19 MD'19

HOMETOWN
Sharon, MA

UNDERGRAD
Wellesley College

MED SCHOOL
Warren Alpert Medical School

RESIDENCY
Warren Alpert Medical School

PROGRAM
Medicine-Pediatrics

Solomon came to Brown with a broad perspective on health. As an economics major interested in structural inequities in health, she wanted a medical education that focused on more than the biomedical basis of disease. "What really resonated with me about PC-PM was the integration of the clinical and structural piece. It was really looking at these ideas as being a central and integral part of your education, which I wouldn't get in any other program," she says.

Whether it was her research looking at smoking- and obesity-related diagnoses in Rhode Island or her LIC rotation in maternal and child health, Solomon stayed true to her initial primary care interests. "In medical school, it's very easy to get pulled into the singular. But it's nice to be pulled back into the big picture as well, and PC-PM has helped me do that," she says.

As a physician Solomon plans to integrate her interests in health equity and access, quality measures and outcomes, and reproductive care. "What drove me, and still drives me, is that my belief that primary care and population health are really important," she says. "There's a distinctive relationship that comes along with getting to know a patient over a long period of time, and I'm excited to build those relationships in the future."

Matthew Perry ScM'19 MD'19

HOMETOWN
Dartmouth, MA

UNDERGRAD
Wesleyan University

POST-BACC
Columbia University

MED SCHOOL
Warren Alpert Medical School

RESIDENCY
Warren Alpert Medical School

PROGRAM
Family Medicine

Perry studied abstract mathematics as an undergraduate; it wasn't until after he graduated that he wanted to become a doctor. "I wanted my work to sit at the intersection of interpersonal care and fighting for structural change," he says. A career in medicine would let him do both.

During his post-bacc Perry was an outreach worker for a clinic in Harlem, connecting young people who had HIV with health care as well as social, educational, and legal services. When he heard about the PC-PM program, with its emphasis on population health, community engagement, and the LIC, he knew immediately it was for him.

One of the best parts of the program, he says, are the relationships. As he decided between psychiatry and family medicine during his third year, Perry was able to have frank conversations with faculty about what he wanted out of his career—discussions that he says were invaluable to his decisions about residency and beyond.

His connections extend beyond faculty, too. "Cultivating longitudinal relationships outside of medicine is important to me, and this program gave us the space and platform to do that," Perry says. He prioritized community partnerships and worked with Showing Up for Racial Justice RI and the AMOR Network, a grassroots community coalition that supports victims of structural violence. "Community organizing and activism will always be a part of my life and the PC-PM helped me develop a foundation on which to build that body of work," he says.

Hiba Dhanani ScM'19 MD'19

Before medical school, Dhanani worked with homeless populations, people affected by the opioid crisis, and patients at free clinics.

"I have always been someone who is interested in health care disparities, before I even knew what that word was," she says. "I grew up in a very service-driven household, and since high school I've engaged in community work, particularly with the homeless community. The groups I have been a part of challenge me to address my privilege in a productive way."

Dhanani was sure she wanted to do family medicine, but her LIC experiences changed her mind. After a surgery rotation at the Providence VA Medical Center, she realized that was the path for her. "The opportunity to intervene is really meaningful. I liked the counseling, the solutions. I didn't expect to love it, but I did," she says.

But she says the PC-PM program will shape how she approaches her surgery practice in a holistic, generalist way that she hopes will make her a leader in the field.

"The PC-PM program has always had a very strong vision to produce leaders in health care who are committed to restructuring health care so it's more equitable," Dhanani says. "They brought visionaries—people who want change, people who demand change, who want to improve people's lives through differences in medical education, in clinical research—who think really big picture and have these great aspirations. And being part of that is special."

HOMETOWN
Lexington, MA

UNDERGRAD
Haverford College

MED SCHOOL
Warren Alpert
Medical School

RESIDENCY
Howard University
College of Medicine

PROGRAM
General Surgery

Jonathan Staloff ’14 ScM’19 MD’19

HOMETOWN
Marlboro, NJ

UNDERGRAD
Brown University

MED SCHOOL
Warren Alpert Medical School

RESIDENCY
University of Washington School of Medicine

PROGRAM
Family Medicine

Staloff came to Brown thinking he’d concentrate in neuroscience. But in his second semester, he stumbled onto a course called “Healthcare in the U.S.”

“It gave me my first exposure to how inequitable and convoluted our health care system is,” Staloff says, who became a community health concentrator. “It was also meaningful because it was taught by a practicing physician. I started to see myself as a potentially practicing physician who cares about larger systemic problems.”

In medical school, Staloff continued building on those interests. During his second year he helped organize a 12-part guest lecture series, “Healthcare in America,” that brought health policy and other leaders to Brown from around the country. He wrote his thesis on physician understanding of accountable care organizations, a key component of the Affordable Care Act.

“The faculty here supported me in my broader interests and also helped me grow as a teacher of health care policy,” says Staloff, who taught an elective on health care policy for his fellow fourth-year med students. “These are things I never could have taken on without the support of the PC-PM program.”

Staloff says no matter what medical school a student attends, there will always be compelling incentives to pursue subspecialty fields. But “what was really special about PC-PM was that developing primary care physicians who think about population health and population medicine was supported, encouraged, and valued,” he says. “I’m just not sure I’d find that elsewhere.”

PHOTO FINISH

Dripping rain did little to dampen the nervous excitement as 125 fourth-year medical students—as well as their friends, families, and faculty—received important and potentially life-changing news on Match Day.

Clockwise, starting with this page: Katherine Rand ’12 MD’19 basks in the annual shower of balloons. Emmanuel K. Asiedu MD’19, left, celebrates with his brother, Daniel K. Asiedu Jr., JD. Students pinned their original ID photo to their residency location on a large map; with more than half of the class—69 in total—staying in the Northeast, the photos fought for space on the coast. Neesha Nama ’14 MD’19’s best friend, Rebecca Li, left, and fiancé, Varun Singh ’13, right, dressed up as matches to support her. Ananya Anand ’13 MD’19, center, her parents, Nina and R. K. Anand, and sister, Namrata, video chat with a friend in India who called exactly at noon to find out where she matched. Yao Liu ’15 MD’19, right, and his fiancée, Margaret Thorsen ’15 MD’19, couples matched and are among the 19 students joining Brown-affiliated programs. **M@B**

To see the entire list of residency matches for the MD Class of 2019, visit brown.edu/go/match2019.

PHOTOGRAPHY: DAVID DELPOIO


NEW YORK
Concord
Portland
Portsmouth
Albany
Allentown
Philadelphia
Baltimore
Dover
NEW JERSEY
DELAWARE

CHECK-UP

What's new with Brown medical alumni

PHOTOGRAPHY: BRYAN REGAN

The Champ

Cedric Bright '85 RES'93, MD, has been working in admissions nearly as long as he's practiced medicine. During his internal medicine residency at Brown, he would help recruit residents to his program; after graduation, he was a clinical instructor and an attending at a clinic in Central Falls, and served on the undergraduate admissions committee for his alma mater.

Michele G. Cyr, MD, who was the director of the General Internal Medicine Residency Training Program at the time, says Bright was their resident recruitment "secret weapon."

"He was so passionate," says Cyr, now senior associate dean for academic affairs at the Warren Alpert Medical School. "It's hard to turn Cedric down."

Bright's passion for admission work is more than alumni pride. He's had remarkable success mentoring and recruiting medical students, house staff, and faculty from groups underrepresented in medicine (URM). Research has consistently shown that a more diverse health care workforce improves health outcomes for people of color.

"You have to ... tell [students] repeatedly, I want you to come back, I want you to come back, I want you to be a faculty member here someday," Bright, the new associate dean for admissions at East Carolina University's Brody School of Medicine, says in a phone interview. "We want to change the face of medicine. ... The best way to do that is by being teachers. Each teacher has the impact to affect a student that may impact a thousand other students along the way."

Before he went to East Carolina in February, Bright was the associate dean for inclusive excellence at the University of North Carolina School of Medicine, where he earned his medical degree. More than 14 percent of UNC's med students identify as black, compared to 7.3 percent nationwide.

He also helped the UNC Health System recruit URM residents and faculty; and he led UNC's Medical Education Development Program, which prepares underrepresented students—including veterans and low-income and non-traditional students—for the rigors of medical and dental school. Since 1974, more than 1,300 MED Program graduates have become doctors or dentists. Bright says it's a critical boost for students who didn't grow up with the advantages he had. → **continued on page 40**

← continued from p39

"There's a difference in the resources that are needed for me, a fourth-generation college student, than for somebody who is first generation," says Bright, who with his wife, Maria, has an 11-year-old son, Andrew. "You can't expect us to be on the same playing field when you start the game."

Growing up in Winston-Salem with "an extraordinary support system," Bright always knew he'd go to college and hoped he'd go to medical school. An African American surgeon at his church became a role model. "He always called me Champ. … 'Are you doing well in school, Champ?'" Bright says. "It kept giving me the feeling, I can do anything because I'm the champ."

Bright calls Cyr, who first encouraged him to study perceived barriers and bias in medical education, one of his "most influential mentors." Now, Cyr says, she turns to him for advice on enhancing diversity at Brown.

"He had a huge impact on our residency and the work that we did, and the patient care we provided," she says. "To have him go out into the world … and be so successful in diversifying institutions and the health professionals who are being educated and trained there, just makes me feel good. It doesn't get any better than that."

—PHOEBE HALL

Linda Shiue, doctor and chef.

The Spice of Life

A MEATY PASSION WARDS OFF BURN OUT

You can almost always find Linda Shiue '93 MD'98 in a kitchen.

She took her first cooking class when she was just 7 years old. As a sophomore at Brown she leaped at the chance to get off the meal plan and cook for herself. Now, as a San Francisco primary care physician, she leads once-a-month cooking classes and shares new recipes on her website, Spicebox Travels.

It's nothing she learned during her medical training, she says. "Most of my nutrition education came in the form of tube feeding and meal replacement in an acute setting, not how food can be used to prevent disease and improve health," she says.

A turning point for Shiue came in 2009 when Francis Lam, a prominent food writer, launched a weekly online cooking challenge on Salon.com. Every week, Lam would create a new Salon Kitchen Challenge centered around a food or theme, and readers would submit recipes.

MS RESEARCHER TAKES A CHAIR

Benjamin Segal '84 MD'88 is chair of The Ohio State University College of Medicine neurology department and co-director of Wexner Medical Center's Neurological Institute. A multiple sclerosis researcher, he was recruited last fall from the University of Michigan. Internationally recognized for his work in MS and neuroimmunology, Segal has directed a number of industry- and investigator-sponsored clinical trials that focus on individuals with relapsing and progressive forms of MS. He completed his medicine internship at the University of Chicago and neurology residency at Cornell University.

"I was one of two people who entered the contest every single week," Shiue says. "I ended up winning several times and had the thrill of my writing and recipes featured in a national web magazine. I had never really written a recipe, so that year gave me great practice."

Spicebox Travels was born in 2010 when Shiue needed a way to archive her recipes. "I really saw it as more of a hobby," she says. "For some reason I never connected my love of cooking with my patient care."

That changed soon after, when Shiue attended a continuing medical education conference on nutrition science and health care. Sessions include scholarly presentations on nutrition, cooking demonstrations, and hands-on training at a culinary school. "At this point, I was 10 years into my career and I was burning out," Shiue says. "But after attending the class, I realized I wanted to do this, and I wanted to tie this into my patient care."

Just one week after the course, she taught her first cooking class to patients. She loved it, and over the next few years, her offerings grew from three or four classes a year to one each month.

In 2016, before she joined a new primary care practice, Shiue took a sabbatical year and attended the San Francisco Cooking School. "I had always wanted to do it and thought that if I waited, I would never have the chance," she says. She learned classical French cooking techniques and how to be a better instructor, while picking up tips and tricks for her healthy cooking repertoire.

Now she's helping create cooking programs at medical centers across the country and working on a cookbook, *The Doctor's Spicebox*, which will be released in 2021, as she continues to empower her patients to lead healthier lives.

"I feel very lucky that I get to do this," Shiue says. "Whatever your passions are outside of medicine and science that have been traditionally seen separate from medicine, are becoming more and more important for your own well-being as a doctor. It's important to not burn out, and being able to do something you love is one way of doing that." **—ANEEQAH NAEEM '20 MD'24**

https://spiceboxtravels.com
Twitter and Instagram: @spiceboxtravels
Facebook.com/TheDoctorsSpicebox

CLASS NOTES

ALUMNI

1970s

Kenneth W. Burchard '69 MMSc'71 RES'80, MD, retired after 29 years of leading the surgical intensive care unit at Dartmouth-Hitchcock Medical Center. A number of Brown alums attended the November 17, 2018, party in his honor held in Quechee, VT, including **Kathy Zug** MD'88; **Victor Pricolo** RES'88, MD; **Pardon Kenney** '72 MMSc'75 MD'75 RES'80, P'03; **Bill Laycock** MD'88; and **Marlene Cutitar** '83 MD'86 RES'92.

Glenn Mitchell '67 ScM'69 MD'75 RES'77, MPH, is one of 12 members of the Pennsylvania governor's health advisory board, which advises the governor on matters of public health including the opioid epidemic, vaccination programs, and mental health issues. He is professor and chair of Healthcare Informatics at Harrisburg University of Science and Technology, and recently stepped down after a two-year term as chair of the faculty.

Robert Parker '73 MD'76 and **Margaret Parker** '73 MD'77 retired from Stony Brook University after 27 years and are moving to the eastern shore of Maryland. They will continue to serve on the editorial boards of *Critical Care Medicine* and *Pediatric Critical Care Medicine* and to be active with the Pediatric Acute Lung Injury and Sepsis Investigators Network.

Alan Muney '75 MD'78, P'04, is a venture adviser at New Enterprise Associates Inc., a venture capital firm, where he will focus on companies within NEA's health care services portfolio. He previously served as chief medical officer at Cigna.

Stephen Upham '75 MD'78 retired from Hartford Hospital in December 2017 after 17 years as medical director. He's returned to direct patient care, seeing patients two days a week at Cornell Scott-Hill Health Center in New Haven, CT.

Paul Zimmering '74 MD'79 retired from orthopedic surgery in December 2017 after more than 33 years practicing. He wrote to the *BAM*: "My wife, Betsey, and I spend the summer at our home in Connecticut and winter at our home in Florida. We welcomed our first two grandchildren into the world during the past year. We are enjoying retirement and our ever expanding family."

Jonathan Gilbert '76 MD'79 is a clinical cardiologist with NorthShore Medical Group in Bannockburn, IL. The former director of the cardiac cath lab at Lake Forest Hospital, he has received several awards for his clinical expertise, including the Compassionate Doctor Recognition and Patients' Choice Award, both in 2014.

Philip Kantoff '76 MD'79 was appointed to the board of directors at Context Therapeutics, a clinical-stage biopharmaceutical company dedicated to the treatment of hormone-responsive cancers. He is chairman of the Department of Medicine at Memorial Sloan Kettering Cancer Center and chairman of the Prostate Cancer Foundation Global Research Council.

1980s

Mark Nunlist '70 MD'80 is a board member of Vermont Information Technology Leaders and continues his interest in population health care. Last summer he completed construction of and launched his Pocketship Puffin boat.

Candace Dyer MD'80 RES'85 is director of the Breast Health Center at Kent Hospital, which earned a three-year, full accreditation designation by the National Accreditation Program for Breast Centers, a program administered by the American College of Surgeons. In its report, the NAPBC recognized her leadership since the center's opening in 2010.

Daniel DiPrete '85 MD'89, P'15MD'19, P'15MD'19, recorded two singles, "The Ghost In You" and "Imagine," that "made it onto the Official Ballot for the 61st Annual Grammy Awards by The Recording Academy" for "Best Pop Solo Performance," he wrote. "Made the cut from about 30,000 down to about the top 1,200 (all 80 categories combined). ... No chance of making that cut but it was fun getting this far." Listen at youtu.be/qkzpvBoWknI and youtu.be/x71IHPWwFf8.

1990s

Roger Waltzman '88 MD'92, MBA, is chief medical officer of Molecular Templates Inc., a clinical-stage oncology company focused on the discovery and development of differentiated, targeted, biologic therapeutics for cancer. A medical oncologist, he has 20 years of experience in the pharmaceutical and biotechnology industries, most recently as chief medical officer at Rgenix.

Marina Catallozzi '92 MD'96, assistant professor of pediatrics and of population and family health at Columbia, was named vice chair of education. An adolescent medicine specialist who has managed pediatric medical education for several years, she will oversee all educational initiatives in pediatrics, including residency and fellowship programs and working with biomedical scholars in training.

Myechia Minter-Jordan '94 MD'98 received the Hubie Jones Award at the 16th annual Martin Luther King Jr. Tribute Concert "She Persisted" in January. The award recognizes dedication to improving Boston's communities. Myechia is the president and CEO of the Dimock Center, an integrated clinical and behavioral health center in Roxbury, MA. (See *Brown Medicine*, Spring 2016.)

Garey Noritz '95 MD'99 was promoted to professor of pediatrics at The Ohio State University, where he directs the Complex Care Program at Nationwide Children's Hospital. He specializes in the care of adults and children with neurodevelopmental disabilities. He lives in Columbus with his wife, Tracey, and two daughters.

2000s

Michelle Quiogue '96 MD'00 is a 2018-2019 Health Equity Fellow of the American Academy of Family Physicians. A family physician with the Southern California Permanente Medical Group, she's a past president of the California Academy of Family Physicians and chairs its Health Equity Committee. She is an assistant clinical professor at the Kaiser Permanente School of Medicine, which will open next summer, and serves on their Equity, Inclusion, and Diversity Advisory Committee.

Elizabeth Schoenfeld '01 MD'05, an assistant professor of emergency medicine at UMass Medical School-Baystate, received a five-year K08 grant from the Agency for Healthcare Research and Quality for her work, "Shared Decision-Making for the Promotion of Patient-Centered Imaging in the Emergency Department." She invites collaborators and critics to email her at ElizSchoen@gmail.com.

Christine Montross MD'06 MMSc'07 RES'10 spoke at Purdue University's Ideas Festival in February about the mysteries of the mind and mental health, especially when the tools of modern medicine fall short. She is an associate professor of psychiatry and human behavior and of medical science at the Warren Alpert Medical School, a practicing inpatient psychiatrist, and an author and poet.

Janell Thompson Vinson MD'07 joined Baptist Health's Pediatric Clinic in Conway, AR. She had previously practiced at Merit Health River Region Hospital in Vicksburg, MS. She completed her residency at Arkansas Children's Hospital in Little Rock through the UAMS Department of Pediatrics.

2010s

Robert Heinl IV MD'15 F'21 married Sarah Simpson on June 9, 2018, in Columbus, OH. Rob's sister, **Nicole Heinl** MD'18, was a bridesmaid; their mother, **Andree Heinl** '83 MD'86, PMD'15, MD'18, was also in attendance.

Mark Nunlist has completed construction of and launched his Pocketship Puffin boat.

Rob completed his internal medicine residency at Emory and is a clinical cardiology fellow at Brown. Sarah is a physician assistant. They live in Warwick.

Hannah Janeway MD'15 will complete her emergency medicine residency at Harbor-UCLA Medical Center this summer and begin the two-year International and Domestic Health Equity and Leadership Fellowship at the UCLA Westwood campus and the Olive View-UCLA Medical Center. Hannah is the vice president of the national organization Women in Medicine.

Shankar Ramaswamy MD'15 is chief business officer of Axovant Sciences, where he identifies, evaluates, and negotiates transactions for new gene therapy pipeline assets and other business development opportunities. He joined the company, which was founded by his brother Vivek Ramaswamy, in 2015.

Jon Thorndike MD'15 RES'19, an emergency medicine resident at Rhode Island Hospital, will begin a two-year fellowship in critical care medicine at Washington University in St. Louis this summer.

Xinan Chen MD'17, MPH, is executive vice president of emerging markets at Roivant Sciences, a global biotech holding company, and cofounder of a subsidiary at Roivant, Sinovant Sciences, a startup in Shanghai aimed at developing innovative medicines in China.

IN MEMORIAM

Mary B. Arnold was known for her love of teaching and mentoring.

Mary Bertucio Arnold, MD, 94, of East Providence, died December 19, 2018. She was posthumously promoted to professor emeritus of pediatrics at the Warren Alpert Medical School. She attended Abbot Academy and Vassar College, where she captained the golf, lacrosse, and tennis teams. In 1950, she graduated from the University of Vermont Medical School at the top of her class. After internship and residency training in pediatrics at Columbia-Presbyterian Medical Center, she completed her fellowship in pediatric endocrinology at Massachusetts General Hospital.

Dr. Arnold began her academic career at the University of North Carolina and in 1966 joined the faculty of the Brown University Program in Medicine, where she would spend the remainder of her professional career, which she pursued well into her 80s. She was the director of pediatric endocrinology at Rhode Island Hospital and chair of the Department of Pediatrics at Roger Williams Medical Center.

Her greatest impact on academic medicine was her energetic teaching in the Integrated Medical Sciences at Brown and her mentorship of young faculty. Her generous spirit combined with her clinical experience, meticulous approach to patient history, and excellent diagnostic skills were a model for young clinicians.

She is survived by three sons, their wives, six grandchildren, and two great-grandchildren. To honor Dr. Arnold's devotion to teaching and mentorship, her family established the Mary B. Arnold Mentor Fund at the Warren Alpert Medical School. Donations will support faculty mentors. Gifts can be made online at brown.edu/go/maryarnold.

John Yashar, MD, 91, died January 11 in Palm Beach Gardens, FL. A native of Iran, he received his medical degree at the University of Tehran and then traveled to the US in 1950, landing at Ellis Island with $50 in his pocket. He pursued his internship and residency at Bellevue Hospital in New York, and continued his studies at Beth Israel in Boston, where he was chief resident. He then trained in cardiovascular surgery at Case Western in Cleveland.

Dr. Yashar pioneered open-heart surgery in Rhode Island, becoming the first physician to successfully complete the procedure in the state; he also helped to found and develop the open-heart surgery program at The Miriam Hospital. He was in private practice with his brother, James Yashar, MD, and simultaneously worked and assumed leadership roles at numerous hospitals in the state. He was a clinical associate professor at Brown University Medical School, where he trained hundreds of physicians, and a member of the Society of Thoracic Surgery, the American College of Cardiology, the Rhode Island Medical Society, and other associations.

Widely known for his love of medicine and compassion for others, he developed deep connections with his patients and their families. His wife of 54 years, Audrey M. Yashar, predeceased him. His family was by his side as he battled Parkinson's during the final year of his life. He is survived by his five children, eight grandchildren, and two great-grandchildren. Donations in Dr. Yashar's memory may be made to the American Heart Association.

PHOTOGRAPHY: WARREN ALPERT MEDICAL SCHOOL ARCHIVES

Abdul-Kareem Ahmed MD'18 is a neurosurgery resident at the University of Maryland Medical Center. An essay he wrote about the uncertainties of his field and patient care, "A Race Against Space," was published in the *New York Times* in January.

Aaron Shapiro MD'19 received a 2019 Excellence in Public Health Award from the US Public Health Service Physician Professional Advisory Committee. The award is presented to med students who are involved in public health issues in their communities. This summer Aaron will begin his internal medicine-primary care residency at Montefiore Medical Center/Albert Einstein College of Medicine.

Eric Bai '16 MD'21, cofounder of TextUp, a cloud-based phone system for social workers and care providers; and **Vishnu Dantu** '19 MD'23, cofounder of Predictive Optics, an imaging system to allow neurosurgeons to visualize cerebrovascular health, were two of the local innovators who received Rhode Island Inno's 2019 50 on Fire awards.

RESIDENTS

1960s

Betty Vohr RES'68 F'70, MD, P'92, was an invited speaker at the Columbia University Annual Alumni Memorial Lectureship. A professor of pediatrics at the Warren Alpert Medical School, she's the director of Women & Infants Hospital's Neonatal Follow-up Clinic, medical director of the Rhode Island Hearing Assessment Program, and national coordinator of the National Institute of Child Health and Human Development Neonatal Research Network follow-up studies.

1980s

Anthony Salerni RES'89, MD, a neurological spine surgeon, joined Littleton (NH) Regional Healthcare in December, where he is providing minimally invasive spine surgeries. He has served at hospitals throughout New Hampshire.

1990s

Jonathan Weiser RES'92, MD, has joined New You Medical in Ft. Lauderdale, FL. He is a board-certified plastic surgeon specializing in cosmetic surgery of the face, body, and breast, as well as reconstructive surgery. He received his medical degree from the University of Miami School of Medicine and completed the Brown residency program in plastic and reconstructive surgery.

Papa Badoe RES'97, MD, MBA, joined SMG Internal Medicine Health Associates in Taunton, MA. His professional interests include cardiology, diabetes management, and international health. He attended medical school at the University of Science and Technology in Kumasi, Ghana, and completed his internal medicine residency at The Miriam Hospital.

2000s

Audrey Tyrka RES'03, MD, PhD, is co-chair of the Women's Task Force of the American College of Neuropsychopharmacology. She's a professor of psychiatry and human behavior at the Warren Alpert Medical School and the director of research training in the psychiatry residency program. Audrey is also the director of research of the Laboratory for Clinical and Translational Neuroscience at Butler Hospital, where she's an attending psychiatrist.

Philip Chan RES'09 F'11, MD, MS, accepted the community award on behalf of his clinic from the Rhode Island HIV and STI Prevention Coalition at an event commemorating the 30th anniversary of World AIDS Day. Phil is the director of the Rhode Island STD Clinic at The Miriam Hospital; the award was presented to the clinic staff "in recognition of their contribution to the health and well-being of the community at large."

2010s

Erin Wilmer RES'17, MD, practices dermatology at Kaiser Permanente facilities on O'ahu and Hawai'i Island. She earned her medical degree from the University of Florida and completed her dermatology residency at Brown. Before coming to Hawai'i she practiced dermatology at Kaiser Permanente Colorado in Denver.

Daniel Harris RES'18, MD, joined Thundermist Health Center in West Warwick as a family medicine provider. A graduate of the University of Virginia School of Medicine, he completed his training in family medicine at Brown.

FELLOWS

2000s

Eric Berthiaume F'05, MD, is the president of University Gastroenterology in Providence, overseeing operations at the practice's three locations. He also consults at Kent County Memorial Hospital and Roger Williams Medical Center. Eric completed his gastroenterology fellowship at Rhode Island Hospital.

John Czerwein F'09, MD, is chief of the Division of Orthopedics at Our Lady of Fatima Hospital in North Providence. A clinical assistant professor of orthopaedics at the Warren Alpert Medical School, he completed his orthopedic spine fellowship at Brown.

Eric Bai and Vishnu Dantu were two of the local innovators who received Rhode Island Inno's 50 on Fire awards.

MOMENTUM

The Power of Mentorship

BROWN TOGETHER

Dear Alumni, Parents, and Friends,


Madeline Johns

There are many things I admire about the Brown medical community, but a commitment to celebrating its mentors always stands out. Faculty members play a significant role in shaping our resident and medical school alumni. In the early years of training, they educate, provide academic guidance, and model behavior that can't be learned from any textbook. They teach students how to listen, how to empathize, and how to treat the patient as a whole person.

As students move through their medical education, faculty can also provide an early look into the world of research. These opportunities can develop an existing interest or ignite a new one, and often have a lasting impact on a physician's trajectory. A good mentor provides the space to succeed and fail, and teaches you the value of both of those experiences.

In many cases, mentors and students strike a kinship that spans entire careers. During the BrownTogether campaign, philanthropy has been a meaningful way for our community to recognize the power of mentorship. We have had gifts that allow us to recognize stellar faculty with new endowed professorships, and others that enable us to bring new faculty, like Dr. Wafik El-Deiry, into our community to inspire the next generation of health care leaders. We have also seen gifts that honor past leaders like Dr. Mary B. Arnold and Dr. Michael G. Ehrlich. Both are revered for their tireless love of teaching and the amazing legacy they have left at Brown.

Thank you for celebrating the many contributions of faculty mentors at the Medical School. They are pioneers, teachers, and friends who remind us what a privilege it is to practice medicine and to be a part of the Brown family.

Thank you all,
Bethany Solomon
Associate Dean for Biomedical Advancement

Progress to Goal

Peter Goldberg

INVESTING IN FACULTY

Action Figure

With 25 years of experience under his belt, oncologist Wafik El-Deiry, MD, PhD, FACP, knows a lot about translating basic research into patient care. He just wants to do it faster. Thanks in part to last year's $50 million gift from Brown University Chancellor Samuel M. Mencoff '78, P'11, P'15, and Ann S. Mencoff P'11, P'15, he's able to do just that.

The gift, which supports medical research and scholars, helped bring El-Deiry to Brown from Philadelphia's Fox Chase Cancer Center, where he was deputy director for translational research and co-leader of the Molecular Therapeutics Program. In the Ocean State, he'll blaze trails as the inaugural director of the Brown-Lifespan Joint Program in Cancer Biology and as the inaugural Associate Dean for Oncologic Sciences at Brown University. El-Deiry is creating a transdisciplinary, translational cancer research program focused on diagnosis, treatment, and prevention.

Meaningful progress in cancer care can't happen without generating new ideas, El-Deiry says; the kind that comes from bringing together a variety of specialists—basic scientists, medical oncologists, radiation oncologists, surgical oncologists, pathologists, biostatisticians, population researchers—to focus on certain types of cancers in what he calls "translational research disease groups." Since arriving in January, the specialist in gastrointestinal oncology and his colleagues have already established 10 of these groups, which meet regularly.

But ideas are nothing without follow-through, he says. "If you have a grant from the NIH, you're working to accomplish goals you thought about two, three, four years ago. If you want to go with your latest, most exciting results and open up new areas, it's this type of gift that allows that to happen."

El-Deiry is no stranger to "exciting results." During his two decades at leading National Cancer Institute-designated cancer centers (prior to Fox Chase, he was chief of hematology/oncology and associate director of the Cancer Institute at Penn State and a tenured professor and program leader at the University of Pennsylvania Perelman School of Medicine), he made numerous important discoveries about how to target cancer cells. Just last year, he co-authored a study published in the *New England Journal of Medicine* showing that the drug larotrectinib helps shrink tumors or prevents their growth in an array of cancers. Nine months later, the FDA granted an accelerated approval for the drug to be used in treating patients.

Cancer cells beware: El-Deiry and his team are coming for you.

Warren Alpert Medical School Archives

INVESTING IN STUDENTS

Imparting Wisdom

Dr. Mary B. Arnold (1924-2018) was a force to be reckoned with throughout her career as a caregiver, teacher, and leader. Known for her extraordinary sense of compassion and a wonderful ability to support and comfort her patients, she was utterly devoted to her trainees (see page 43 for her obituary).

As a founding faculty member of Brown's medical school, Dr. Arnold played a key role in the health care landscape in Rhode Island. Dr. Arnold's long list of mentees includes stellar clinicians and academic leaders, many of whom have gone on to have a meaningful impact on the Medical School and its students.

One of those mentees is Philip A. Gruppuso RES'81 F'83, MD, professor of pediatrics, of medical science, and of molecular biology, cell biology, and biochemistry at the Warren Alpert Medical School. Dr. Gruppuso, who served as Brown's associate dean for medical education from 2005 to 2013, remembers Dr. Arnold fondly. "Mary's love for the science and clinical art of endocrinology was one of the things that led me to pursue a career in that field," he says. "As a teacher and mentor, she was always inspiring, nurturing, encouraging, and demanding. She was also more fun to work with than just about anybody."

To honor Dr. Arnold's legacy, her family, with additional support from the Brown community, has established the Mary B. Arnold, MD, Medical Education Mentoring Fund to support faculty development for medical student mentors. Gifts to the fund can be made at brown.edu/go/maryarnold.

Peter Goldberg

Remembering a Titan

Dr. Michael G. Ehrlich (1939-2018) was renowned in the Brown medical community for his role as a physician, researcher, and educator. Dr. Ehrlich served as the Vincent Zecchino, MD, Professor of Orthopaedics at Brown and chair of orthopedics at Rhode Island Hospital and The Miriam Hospital. In addition to providing excellent patient care and conducting pioneering research, he touched the lives of countless medical students, residents, and fellows. But more than anything, Dr. Ehrlich's trademark was his kindness.

Always sporting his signature bowtie and with a wry sense of humor, Dr. Ehrlich approached patient care and mentorship with equal aplomb. "He introduced me to the world of orthopedics like no one else could," says Robert Shin '96 MD'00, an orthopedic hand surgeon in the Hawaii Permanente Medical Group. "Dr. Ehrlich helped me find my purpose, and I have been hooked on orthopedics ever since. His impact on my career choice has been immeasurable, and for that, I am forever grateful."

With three decades of influence in the Rhode Island medical community, Dr. Ehrlich's leadership made Brown a nationally recognized institution for its innovative medical education and orthopedic residency program. To honor Dr. Ehrlich's legacy of educating generations of medical leaders, the Brown community has come together to establish the Michael G. Ehrlich, MD, Memorial Term Scholarship to support a current student at the Warren Alpert Medical School. Gifts to the fund can be made at brown.edu/go/michael-ehrlich.

Physician Plus

A new kind of doctor who treats patients and systems.

Five years ago, when the Primary Care-Population Medicine program was first proposed, it was, like most new ideas, met with healthy skepticism. The concept of a dual-degree program focused on primary care raised questions, not to mention that it would increase the class size by up to 24 students, potentially changing the small, boutique feel of the Warren Alpert Medical School.

The questions were reasonable. Is this going to be some kind of med school-lite program, where students can skip some of the required clinical rotations? The exact opposite, actually—they do more work since they have to do original research and a thesis to earn the master's degree. What if the students change their mind and end up not going into primary care? Not a problem; all types of physicians can benefit from training in population medicine. If that's true, then why not teach it to all medical students? They do; content on the "third science"—health care systems—was integrated into the curriculum for all students.

Two years after the first students were enrolled, I began working with PC-PM students to create recruitment materials for the program. I was fascinated by how they all felt the program was going to help them be the physician they envisioned themselves becoming, even though they each had very different goals. In addition to the regular aspects of medical education and their scholarly work, they got leadership training and media training, ensuring that when they go out into practice, they'll have the skills to make real change in the health system as leaders and advocates.

And here they are, the first graduates getting ready to go out into the field. Like all experiments, the PC-PM has been tweaked over the years and will continue to evolve based on student feedback. (We love feedback here.) But judging by their Match results, the first batch of MD-ScM grads are well on their way to becoming what Assistant Dean for Primary Care-Population Health Jeffrey Borkan, MD, PhD, calls "a physician plus."

—KRIS CAMBRA, Editor

I recently read the fall edition of *Brown Medicine* and noticed several articles highlighting the accomplishments of former active-duty medical students and an active-duty resident's deployment experience. As an active-duty physician and alumnus of the Brown emergency medicine residency program, I wanted to say kudos to featuring them.

PAUL ROSZKO
RES'14, MD, 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.

CORRECTIONS CORNER
The illustration credit for the story "Body Double" in the winter issue of *Medicine@Brown* (page 05) was incorrect. The credit should have been Visible Body. We apologize for the error.

TODAY'S STUDENTS / TOMORROW'S PHYSICIANS

"Receiving a BMAF scholarship has given me the opportunity to attend my dream school. I immediately fell in love with the atmosphere and people at Warren Alpert Medical School—how they foster collaboration and creativity rather than competition. I've never been part of such a diverse, talented group of students. My hope is to one day be in a position to make a gift that allows someone to chase their dreams the same way yours is allowing me to chase mine."

Anthony Cloyd MD'22

Your support to the Brown Medical Annual Fund (BMAF) makes dreams come true for students like Anthony.

Make your gift today at gifts.brown.edu.
Questions? Email bmaf@brown.edu

BROWN
Alpert Medical School

INSPIR/NG THE PHYSICIANS OF TOMORROW

BROWN TOGETHER

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Brown University
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Providence, RI 02912

IT TAKES A STEADY HAND

At the first-ever Student Neurosurgical Research Conference in February, neurosurgery resident Matthew Anderson RES'23, MD, left, teaches Adriel Barrios-Anderson '17 MD'21, center, and Paige-Ashley S. Campbell of the University of Chicago Pritzker School of Medicine how to use a surgical drill to place a burr hole in skull caps. The conference was hosted by the Warren Alpert Medical School's chapter of the American Association of Neurological Surgeons and sponsored by the Brown Neurosurgery Foundation.

PHOTOGRAPHY: JORDAN EMONT MD'20