

SPRING/SUMMER | 2022

# PENN Medicine



## A SOUND FOUNDATION

**AN INTEGRATED ULTRASOUND CURRICULUM PUTS SKILLS  
AT HAND FROM THE START OF MEDICAL SCHOOL**

Plus:

How a Penn Team Stepped Up COVID Testing for a Community at Risk of Being Left Behind

Why Academic Medicine Must Embrace Change: The Dean's View



# THE HOSPITAL'S HALO

The top of the Hospital of the University of Pennsylvania's Pavilion lit up in colors for the first time this winter.

By Daphne Sashin

Photo By Dan Burke

The Pavilion building, a state-of-the-art inpatient facility which opened in October, has two segments equipped with LED lights: the roofline of the 15th floor and the roofline of the mechanical towers in the center of the building, known as the mechanical penthouse. Together, they are called the Pavilion's halo.

The halo was designed to allow Penn Medicine to light up in themed colors along with other buildings in the city.

After spending most of February red for heart disease awareness, the halo turned blue, green, pink, and purple on International Rare Disease Day (Feb. 28); and blue and yellow, the colors of the Ukrainian flag, following Russia's invasion of Ukraine. This act of solidarity coincided with a fundraising campaign in which the University of Pennsylvania and Penn Medicine matched employees' contributions to raise more than \$300,000 toward relief efforts for Ukrainians.



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## PENN MEDICINE

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To meet the challenges of the extraordinary times we are living in and improve health for all, we must catalyze change in academic medicine. Dean J. Larry Jameson, MD, PhD, delivered this message at the conclusion of his term as chair of the Board of Directors for the Association of American Medical Colleges.

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## Where Big Impact Starts Small

**P**enn Medicine's new Pavilion is a massive 1.5 million square feet of advanced clinical space. Penn's transplant team performed its 1,500th lung transplant — among the largest number of these complex surgeries at any hospital in the country. More than 562 million doses of COVID-19 vaccines based on mRNA technology developed at Penn Medicine have been administered in the U.S. to date, in addition to vaccines given in over 200 other countries spanning the globe. In so many examples of efforts across Penn Medicine, there is proof of complex medicine making a big impact.

Penn Medicine is also a place where people see the value and power of starting small and starting simple. In this issue's cover story, we explore the Perelman School of Medicine's unique emphasis on teaching medical students how, when, and why to use ultrasound throughout their training. As a result, time and again, medical students on their clerkship rotations, as well as PSOM graduates beginning their careers, find themselves picking up a point-of-care ultrasound device when other clinicians might not, giving them the power see what's happening inside their patient's body — an ectopic pregnancy in one example, fluid in the heart in another. Through a relatively simple act of looking, using an established and noninvasive technology, they learn and alter the course of a patient's treatment.

Simple things can be an important start on the road to something more. Just look at the feature story in this issue (p. 24) about an outreach initiative in Philadelphia's Kensington neighborhood. Three members of Penn Medicine's hospital and research staff, who hadn't worked together directly before the COVID-19 pandemic, came together early in the spring of 2020 to help a community in need. With very little initial funding, they created a free COVID testing program, every week for two years, for a community that otherwise wouldn't have been tested. As the story details, too, offerings like this are a simple start in another way — as harm reduction, helping instill trust between people who use drugs and the medical system that often doesn't treat them well. As McFadden noted, a positive interaction can be a good first step toward getting more medical care when they need it, including for substance use disorder.

Penn is a place where tackling the biggest challenges — like curing cancer — often start small, with bold ideas that are too risky and too complex to scale up out of the gate. That lesson is clear this year as we've passed some remarkable milestones for the cellular therapy treatment for cancer, which was first tested at Penn Medicine over a decade ago. The initial trial of this chimeric antigen receptor (CAR) T cell therapy was tiny — just three patients. Patient number one was Bill Ludwig, a retired corrections officer who had been battling chronic leukemia for 10 years. Then Doug



Emily Whitehead (center, with parents Tom and Kari Whitehead), the first pediatric patient to receive CAR T cell therapy, and those who made it possible: Bruce L. Levine, PhD, Stephan A. Grupp, MD, PhD, Carl H. June, MD, and David L. Porter, MD.

Olson, a scientist, who likewise found his cancer was no longer responding to standard treatments. Both of these first two patients, after being infused with engineered versions of their own bodies' T cells, went into rapid remission and made international headlines. That success was followed a year later by a pediatric trial at Children's Hospital of Philadelphia (CHOP), and another patient number one: Emily Whitehead, then just turning seven years old.

Today, the impact of those three individual volunteers is enormous. Both Ludwig and Olson still had sustained remissions and persistent populations of CAR T cells in their bodies 10 years after their treatments, Penn researchers reported in *Nature* earlier this year, a result so remarkable that they used a word around which that they usually hedge: These patients were cured. Olson recently celebrated his 75th birthday surrounded by family. Ludwig, sadly, passed away due to COVID-19 in 2021, but not before touring the country with his wife in an RV, enjoying a healthy retirement that cancer nearly took from him. Emily Whitehead, now a teenager with a driver's license who is looking toward college, just celebrated 10 years cancer-free.

The impact of the work is up in lights this spring — a major documentary film, "Of Medicine and Miracles" covering CAR T cell pioneer Carl June, MD, and his team's work to develop this new approach and the Whitehead family's emotional journey through treatment and beyond, will debut in June at the Tribeca Film Festival, with a wider release to follow. And the impact is reaching across the globe, with at least 15,000 patients worldwide having received CAR T therapy so far. Most recently, Penn and CHOP signed research agreements with the government of Costa Rica to help facilitate access to new investigative CAR T treatments for patients in Central America. And the therapy received its third FDA approval, this time for the treatment of adults with relapsed or refractory follicular lymphoma.

There is one big lesson in all of this, and it's a simple one: In science, medicine, and life itself, whatever is worth doing, small steps matter.

RE

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## A WELCOME HELLO BEFORE A LONG GOODBYE

The Class of 2022 celebrated Match Day together again at last.



Thad Woodard, left, was delighted to celebrate Match Day in person with family, friends, classmates, and faculty.



As an incoming ophthalmology resident, Michelle Guo learned of her match via computer on February 8th.

Sunshine. Selfies. Squeals of joy.

All the sights and sounds of this year's Match Day, held on March 18th.

Were it not for the face masks everyone wore, you wouldn't know that Match Day 2022 was happening almost exactly two years after the COVID-19 pandemic introduced "social distancing" into common parlance and forced celebrations like this online.

For the crowd gathered in the Jordan Medical Education Center atrium on this warm, sunny day, the typical Match Day energy was amped up to an even greater degree by the thrill of being able to gather in person. With community case rates of COVID-19 at low levels, and with requirements for indoor masking and rapid testing before the event, students, faculty, and their loved ones were able to safely celebrate together.

"It was incredible to see so many of my peers again!" exclaimed fourth-year student Thad Woodard, who was elated to have his fiancée and family as well as his classmates by his side when he opened the envelope revealing his match: the orthopaedic surgery program at the University of California, San Diego. "Due to COVID, many in-person gatherings both inside and outside of clinical time were postponed, so I hadn't seen some people in over a year!"

Woodard was one of 160 students from the Perelman School of Medicine who will begin residency in July. Of those entering the match, 97 percent were matched, and

99 percent of students who matched will train at an academic program. The top specialties included internal medicine, pediatrics, psychiatry, anesthesiology, and emergency medicine. Overall, a third are pursuing a primary care path. Students matched to programs in 20 states, and nearly one-third of them will continue their training at Penn Medicine or the Children's Hospital of Philadelphia.

One of them is Michelle Guo. Because urology and ophthalmology programs announce their matches early, she found out on February 8 that she'd be spending the next four years at Penn — with a preliminary medicine internship at Pennsylvania Hospital followed by residency at the Scheie Eye Institute. Guo was on a trip with friends, who surprised her with balloons and decorations before she logged on to her computer to see her match. "I'm grateful that I have had the chance to familiarize myself with the different clinical sites that I'll be rotating through as a resident," she says. "From completing my intern year at the nation's first hospital, to learning from world-class leaders at Scheie and CHOP, to serving our diverse patient population, I look forward to the next four years."

And that's what it's all about, reflects Senior Vice Dean for Medical Education Suzi Rose, MD, MEd, who was also glad to be back in person after two years of fully or partially "virtual" Match Days: "I never tire of witnessing the anticipatory tension dissolve into peals of excitement and joy as matches are revealed. The Match list is spectacular. We are so proud of them!"

— Meredith Mann





# A SUCCESS STORY FROM SOUTHERN AFRICA

## THE BOTSWANA-UPENN PARTNERSHIP CELEBRATES 20 TRANSFORMATIVE YEARS

BUP staff conduct ward rounds at Princess Marina Hospital in Gaborone, Botswana.

It started with a clear mission: Help tackle the HIV/AIDS epidemic, then raging throughout Botswana and elsewhere in Africa.

At its peak, 25 percent of Botswana's population was infected. Between 1986 and 2002, life expectancy in the country dropped precipitously, from 61 years to 50 years. The toll of human suffering was astounding.

But in the past 20 years, Botswana's annual AIDS-related death rate has fallen from 18,000 to under 5,000. For the population aged 15 to 64 years, the country has achieved "90-90-90" targets: 93 percent of HIV-positive individuals know their status, 97 percent of those are receiving treatment, and more than 98 percent of them have an undetectable viral load. Botswana seems to be on track to meet the even more ambitious 95-95-95 targets for the same domains by 2025.

The incredible progress is due in no small part to the Botswana-UPenn Partnership (BUP), a multipronged project to provide HIV/AIDS treatment. Over two decades, it has morphed into something greater than its initial AIDS-crisis mission — a clinical success story on many fronts, a true scholarly exchange, a fruitful research alliance, and an educational investment.

The project launched as a joint effort of Botswana's government, the Bill and Melinda Gates Foundation, and the Merck Foundation. According to Harvey Friedman, MD, a professor and the former chief of Infectious Disease at the University of Pennsylvania's Perelman School of Medicine, Penn was eager to help roll out an HIV care program at the center of the epidemic, while developing a global health training opportunity.

### From HIV to Support Across the Atlantic

With BUP's start in 2001, Botswana became the first African country to offer free HIV care. At first, it focused on HIV/AIDS treatment with Penn personnel serving as consultants; by the second year, Friedman had hired a full-time in-country director, and at its peak the program had a workforce of 140.

In 2004, Penn medical students began six-week rotations at Botswana's Princess Marina Hospital. Later, they were joined by residents from different specialties — infectious disease, radiology, pathology, general medicine, surgery, and more. Friedman eventually rented a home in Botswana for the 39 trips he made there between 2002 and 2016.

While BUP's primary mission was to provide treatment for HIV/AIDS and, eventually, other diseases like tuberculosis (TB), the program also helped buoy the country's health infrastructure. In 2009, Penn assisted the University of Botswana in launching a medical school which soon started sending its own students for rotations in Philadelphia.

"The culture of openness to collaboration in Botswana makes it relatively easy to establish partnerships that are mutually beneficial," according to Robert Gross, MD, MSCE, professor of Medicine and of Epidemiology and co-director of the Penn Center for AIDS Research, who also directs the center's international arm in Botswana. "The need for many questions to be answered about clinical care, determinants

of health, and disease outcomes creates enormous opportunity to answer research questions about diseases like HIV, TB, cervical and other cancers, child health, accidents and injury, and many others," he explains. "Answering these questions often has the two-fold benefit of addressing local needs for medical solutions in Botswana while also informing the global health community about issues that generalize to many other countries, if not the whole world."

### Taking Stock

The net impact? BUP has "contributed to establishing a robust health infrastructure for stabilizing the epidemic, saving hundreds of thousands of lives, and helping Botswana move to a phase where HIV is no longer a threat to national survival," Gross says. "Rather, HIV is the biggest health problem among other problems the country faces."

In addition to the dramatic drop in the AIDS-related death rate, the number of cases is starting to gradually decrease, notes Corrado Cancedda, MD, PhD, associate professor of Clinical Medicine, director of BUP, and strategic advisor for academic partnerships at the Center for Global Health. "It's not going to zero because people are not dying from AIDS; the people who got infected 20, 15 years ago now are in treatment and living long and healthy lives."

Besides these striking HIV/AIDS clinical outcomes, BUP has helped improve other health issues, points out Glen Gaulton, PhD, professor of Pathology and Laboratory Medicine, vice dean, and director of the Center for Global Health. This includes raising awareness of the confluence of HIV infection and substance abuse, rolling out a national eye care program, and training care providers in dermatology and oncology.

Additionally, says Gaulton, "To me the biggest legacy is always in leadership." He notes that many alums of the program now play prominent roles in the University of Botswana and in the nation's government, including now-Dean of Medicine Dr. Oathokwa Nkomazana, and Vice Dean for Research/Graduate Studies Dr. Doreen Ramogola-Masire, both of whom served previously as the in-country BUP director.

In addition to BUP's clinical outcomes, the partnership's support of the University of Botswana's educational efforts is a pride point. "The medical school is flourishing and we played a role in that," reflects Friedman. "That's the piece that hits me the most."

### What the Future Holds

As BUP looks back on two decades, the work is far from done. And, like everything else in the world, it has felt the effects of the COVID-19 pandemic. While the need to curb travel for the past two years has spurred innovation — case conferences among medical students, and seminars on caring for patients with COVID, went virtual and were accessible across the globe — it also curtailed medical student exchanges (which may resume this year) and delayed the start of a new BUP internal medicine residency program.

Penn's experts have been helping their Botswana counterparts manage the response to COVID. Ironically, the omicron



Health Clinic staff familiarize themselves with a mobile device that can be used for early detection of preventable forms of blindness.

variant was discovered there shortly before the U.S. Centers for Disease Control and Prevention awarded BUP more than \$2 million in grants to further develop infrastructure and clinical capacity to address antimicrobial resistance and infectious diseases.

Gaulton affirms that this funding will be put to good use. "We will establish a national infection control program to help Botswana combat current and emerging viral and bacteriologic infections, and we will advance an innovative approach to conducting rural health care," he says.

BUP's educational arm also has big plans. For one thing, according to Gaulton, over the next five years, the program is committed to helping the University of Botswana "build out an internal medicine residency program that is entirely internal." (Currently, students travel to South Africa for a large portion of the training.) BUP further hopes to expand beyond its medical core to include social work, veterinary medicine, and other fields.

"We don't have an endpoint, like saying 10 years from now, we can wind down BUP," according to Cancedda. "We will decide with our partners in Botswana the modality and timeline of our engagement going forward."

For the foreseeable future, there's still so much more learning, caring, and teaching to do, for the benefit of the people and physicians in Botswana and the Penn students and faculty learning by their side.

— Meredith Mann



## STEPPING INTO THE RIGHT ROLE

Courtney Schreiber's career path set her up perfectly to become the new executive director at FOCUS on Health and Leadership for Women.



When Courtney Schreiber, MD, MPH, sat down with her ninth-grader to help with an English essay, it seemed like an ordinary mother-daughter moment. But it was also a very full-circle moment for Schreiber, the new executive director of the Perelman School of Medicine's FOCUS on Health and Leadership for Women. "I received a phone call from a woman needing some urgent advice," explains Schreiber, "so I stepped away from helping my daughter."

After taking the call, Schreiber returned, apologetic for having left her daughter's side. Rather than expressing disappointment, Schreiber's daughter responded that she not only understood, but admired the mission of her mother's work all the more seeing her in action. That mission — to improve the lives of women and elevate their position in society — goes back to Schreiber's own childhood.

There's little question that Schreiber developed that mission thanks to seeing her own parents in action. Her father, Alan D. Schreiber, MD, a professor emeritus of Medicine and assistant dean for research at the Perelman School, encouraged her from a young age to pursue medicine. "My father was very encouraging — he viewed academic medicine as a good career path for women, believing that women often make great clinicians, and in our ability to make important contribution to our fields," Schreiber says. "My mother was a social worker who focused on patients with fertility issues. Between the influence of them both, I found my career path."

That path has included the wearing of many hats at Penn, among them the Stuart and Emily Mudd Professor of Human Behavior and Reproduction; chief of family planning in the department of Obstetrics and Gynecology; founding director of PEACE, the Pregnancy Early Access Center; and since

October, the executive director of FOCUS, which supports the advancement and leadership of women in academic medicine. She succeeds Stephanie Abbuhl, MD, GME'83, now an emeritus professor of Emergency Medicine, who led FOCUS for more than two decades.

In this latest role, Schreiber says, she is able to combine her micro and macro approach to supporting women in similar fields of work and health care in general. "When this opportunity came up, it gave me a megaphone about the importance of gender equality in health care, science, and the field of medicine," she explains.

Schreiber views FOCUS as an organization with the ability to help shape the culture both within the medical school, and beyond its four walls. "We have amplified the expertise of our female colleagues and provided a stage for their contributions," she says. "We also have data-driven initiatives to measure the proportion of female faculty that are recruited, retained, and promoted at PSOM. We're looking at differences by race, ethnicity and gender to track our progress as an equitable institution compared to others across the country."

Examples of this work in action include the FOCUS-led lunchtime seminar series, where female professors have presented on topics like "Microaggressions MACROIMPACT," and "Addressing the Crisis of Children's Mental Health," which ran this fall via Zoom.

From where she stands, Schreiber says that academic medicine can learn a good deal from the business world. "They've made more progress integrating women into leadership roles than we have," she says. "The numbers haven't changed much in medical academia in over 20 years. With FOCUS, we are providing support and networks to those who need them most, and we hope to work collaboratively with all PSOM initiatives to apply an equity lens that harnesses the power of women-identified faculty."

The pandemic is a good example of this mission at work, serving as an accelerator as inequities of all sorts became glaringly apparent. "The FOCUS team, together with Children's Hospital of Philadelphia, received outside funding to award grants to faculty members with extenuating circumstances due to caregiving," Schreiber explains. "This allows them to sustain their careers even with the systemic issues revealed during the pandemic."

Looking forward, she says: "My hope, my belief, is PSOM can lead the way in sex and gender equity in the workforce, in health care, and in science. The time is now to overcome barriers and open our eyes to new points of view, new solutions. We will all be better for it."

— Amanda Loudin

## REWRITING THE STORY

Penn's new Chief of Breast Surgery Lola Fayanju uses the storytelling power of data to tackle health disparities.

Oluwadamilola "Lola" Fayanju, MD, MA, MPHS, FACS, knows how to read — deeply, discovering nuances, understanding cultures and unwritten rules. Prior to earning her medical degree at Washington University and training in breast surgery at MD Anderson Cancer Center, she received her master's degree in comparative literature from Harvard. It's an unconventional stepping stone on the path to medicine, to be sure, but the skills she honed studying literature — analyzing, synthesizing, empathizing — are part of what make her an excellent doctor. More than that, these add to the clinical and research skills she's using to create a more equitable future for all patients, specifically women of color.

Fyanju joined Penn from Duke University in 2021. She is the chief of breast surgery for Penn Medicine, surgical director of the Rena Rowan Breast Center in the Abramson Cancer Center, and the Helen O. Dickens Presidential Associate Professor in the Perelman School of Medicine.

As a practicing breast surgeon, she relishes her ability to help each patient individually. But it's research that appeals to her narrative instincts to describe a bigger picture: "It's an opportunity to tell a story with data and to convince an audience that what you've learned is something worth listening to and ideally worth acting upon."

One venue where she has advanced such an argument is a *Journal of the American Medical Association* essay, "Hiding in Plain Sight." In it she notes that the unequal breast cancer death rates for women of different races — a widening gap that is now 41 percent higher in Black women — can't be simply explained by an aggressive form of breast cancer that is more prevalent in Black women. The disparity stems from the more common type of breast cancer which occurs in women of all races.

Such points have become a hallmark of her work: challenging other physicians to not rely on biology to explain away social determinants that can lead to adverse outcomes. "That's been the biggest surprise of my career," she says, "learning just how much disparity is not rooted in biology, that it really is rooted often in things that we can do something about."

Fyanju's research, which is NIH-funded, focuses on finding those things that can be changed. She notes in the *JAMA* essay that these can include patient factors, such as the lack of a primary care physician or other limitations on access to care; clinician factors, such as implicit bias that alters their choices; and system factors, such as a state's decision not to expand access to Medicaid.

Currently, she is expanding upon her exploration of barriers that prevent timely care by working to determine how COVID-19 has affected access to imaging, in collaboration



with Penn radiologists Christine Edmonds, MD, and Emily Conant, MD. But this work doesn't end with a cancer screening. "We are working on a project to facilitate delivery of care in a way that should hopefully reduce disparities and accessing diagnostic workup after a mammogram," Fayanju says. When it comes to accessing surgery for those in need, Fayanju has welcomed the chance to partner with the Center for Surgical Health, a Penn medical student- and resident-led program launched last year that aids un- and underinsured patients who need surgery with care navigation, financial assistance, health literacy, and more.

After transitioning to her new academic home in the middle of a pandemic, Fayanju is still learning Penn's culture and flow, which she describes as "vibrant and smart." These choice words can also describe the new story of a more equitable world Fayanju is writing into existence.

— Tonya Russell



# SOMEONE WHO LOOKS LIKE YOU

To better serve patients from all backgrounds, Penn is leading a multi-university effort to increase racial and ethnic diversity in genetic counseling.

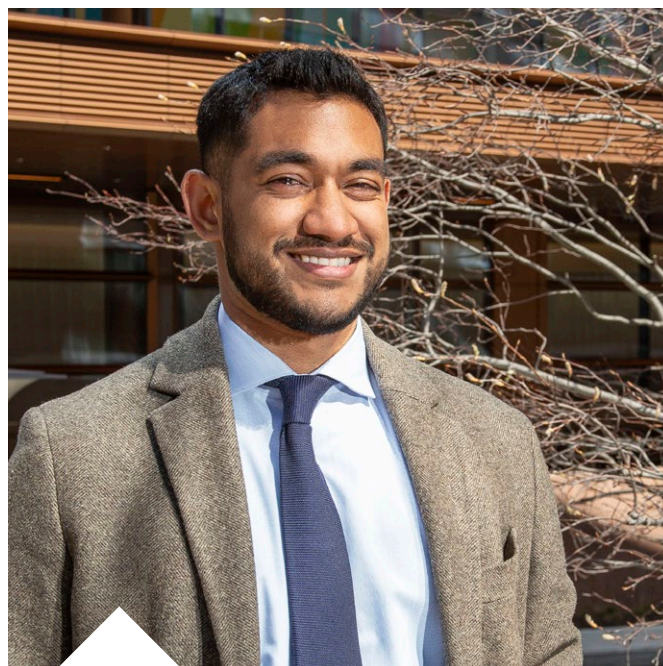
Chad was not yet a teenager when he made an emotional plea to his baseball coach.

He had a condition that caused his lungs to fill with blood. Medication helped manage the disease but led to weight gain and fatigue. He was being bullied as a result. Chad's mother suffered from mental health issues serious enough that he lived with his grandparents. He had never met his biological father.

Chad needed emotional support as he sought to learn more about his condition and track down resources. Fortunately, his coach listened, and learned as well, so that he could provide appropriate emotional support. That coach was Avi Anantharajah, Chad's teenage camp counselor. As he sought more information to help his young player, Anantharajah was taken in by the combination of biology and humanism he was suddenly providing. This in turn led him to the field of genetic counseling, and it became his life's calling.

After graduating in 2021 from the Master of Science in Genetic Counseling Program at the Perelman School of Medicine, Anantharajah is now a practicing genetic counselor with the Cancer Risk Evaluation Program at Penn Medicine's Basser Center for BRCA.

Genetic counseling is a young and growing profession, aiding patients with everything from pregnancy to prostate cancer.



Avi Anantharajah, MS'21, found that genetic counseling suited his interests in both biology and humanism.

As it stands, however, the workforce is overwhelmingly white and female, leaving under-resourced and diverse populations out of the loop.

"Patients who see a clinician of a similar race are more likely to experience higher-quality communication with their provider," Anantharajah said. "This highlights the importance of improving minority representation within the genetic counseling workforce. It also highlights the importance of training clinicians to engage in practices that strengthen the therapeutic relationship between themselves and their patients, especially when factors that limit communication are present."

A recent grant awarded to the Master of Science in Genetic Counseling Program at Penn Medicine will do just that, addressing the inequity by attracting, training, and supporting a more diverse genetic counseling workforce. This ultimately means reaching more people in need, especially in racially or ethnically diverse areas, where access and negative perceptions are common barriers to seeking help from a genetic counselor.

## A Growing Profession

"Genetic counseling is a communication process for people who have genetic conditions or who might be at risk," explained Kathleen Valverde, PhD, LCGC, director of the Master of Science in Genetic Counseling Program. "This is where people can come to learn more about genetic conditions and decide whether they want to have genetic testing. And if they are tested, they can learn more about the treatments or medical services that might be available to them."

It is often challenging for patients to come to grips with incurable conditions. Genetic counselors step into that emotional breach, leading patients through often-complex processes with compassion and empathy.

"We help people adjust to their diagnosis," Valverde said. "Genetic conditions are lifelong, and can affect family members as well, so patients need to have a good understanding about the inheritance of their condition. If they have genetic testing without pre-test counseling, sometimes people do not have enough information about the testing or their condition."

This unique niche has helped make genetic counseling a growing profession. According to data from the National Society of Genetic Counselors (NSGC), the genetic counselor workforce increased from 1,155 in 1999 to 5,629 in 2021 — doubling just since 2010.

Despite this growth, the profession has struggled to find and attract diverse candidates, particularly among those

underrepresented in genetic counseling. According to Valverde, there are several factors, including the cost of training, a relative paucity of programs, and difficulty navigating a complex application process. NSGC data show that in 2020 the genetic counseling workforce was 90 percent white. Only 2 percent of genetic counselors were Black, while 2 percent identified as Latinx.

Experts agree that genetic counseling can make a powerful impact in underserved communities, with clinicians who reflect that community's demographic makeup. But this is easier said than done.

"There's skepticism about testing and mistrust of the system in some racial and ethnic communities," Valverde said. "They miss out on an opportunity or don't know to seek it out. This could be partly due to the lack of providers who look like them, or who understand their social or cultural concerns."

That's something Isaac Elysee hopes to change. Elysee graduated from the Penn genetic counseling master's program in 2021 and was originally motivated to study genetics by his father, who had sickle cell disease, a genetic condition common to the Black community.

"I was really interested in genetics from a young age," he recalled. "This was in large part because of my father. I felt that with genetic counseling, I can help people through sometimes difficult discussions. How you interact with patients of different backgrounds and beliefs is a really important part of what we do."

Elysee is now a counselor at Penn Medicine in the Division of Translational Medicine and Human Genetics helping a wide range of patients with a wide range of genetic conditions.

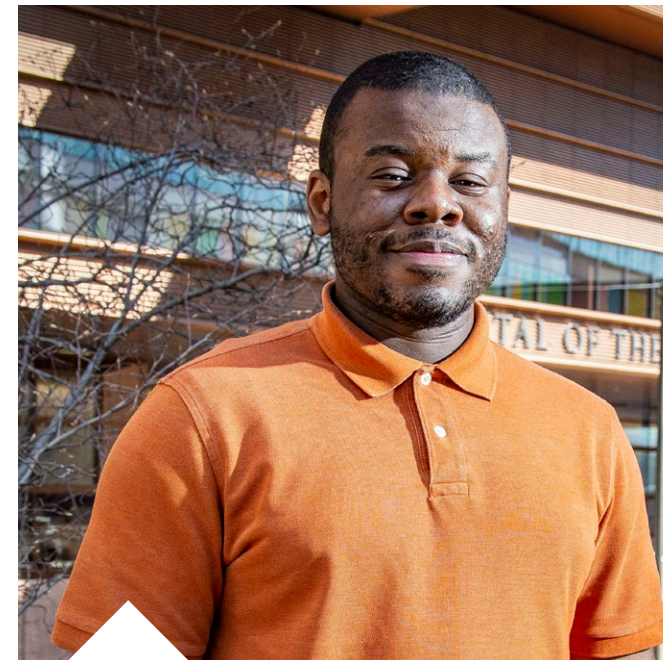
"Some patients I interact with have dealt with health concerns for extended periods without a known cause," he said. "Even if genetic testing is unlikely to find a cause for their symptoms, I can help by simply listening and empathizing with them about the difficulties or frustrations that these unexplained health concerns bring."

## A New Alliance

Genetic counselors who are Black, like Elysee, are rare today. But the new grant to the MSGC program Penn Medicine from The Warren Alpert Foundation is designed to change that.

The \$9.5 million grant helped establish the Alliance to Increase Diversity in Genetic Counseling. With the Perelman School of Medicine leading the way, this new consortium will unite top programs across the Northeast, including at Boston University School of Medicine; Rutgers, The State University of New Jersey; Sarah Lawrence College; and the University of Maryland School of Medicine.

Each year for five years, 10 students from racially and ethnically diverse backgrounds will receive full tuition support and a cost-of-living stipend.



Isaac Elysee, MS'21, was motivated to study genetics by his father, who had sickle cell disease.

In addition, the Basser Center also provides a scholarship for a genetic counseling student from an underrepresented background.

"Recruiting and training underrepresented individuals in genetic counseling will increase the numbers of professionals in the field, leading to an increase in access to community-based genetic education and genetic counseling services delivered by individuals who reflect different populations," said August Schiesser, executive director of The Warren Alpert Foundation.

## Causes for Optimism

Genetic counselors from underrepresented groups are well-positioned to address systemic mistrust — and improve health and well-being — in these communities. The Penn program's 2023 class is a step in the right direction, with 35 percent of its students hailing from underrepresented backgrounds.

"The efforts now to increase diversity in the field will hopefully go a long way to promoting trust among people," Elysee said. "As long as you're treating that person with respect and with an eye toward helping them understand what's going on, you'll be successful. All parts of the population do indeed have genetic disorders. They affect people of all backgrounds, all ethnicities, all religions. Genetic counselors can help, especially with patients who look like them."

— Scott Harris



# Muscle Memories

As she closes the door to her lab after a career spanning six decades, Clara Franzini-Armstrong, PhD, opens a window to discovery for future generations of scholars with her vast repository of muscle micrographs.

By Meredith Mann



**Portrait of a young scientist:** In this photo, the electron microscope is not visible, but Franzini-Armstrong is surrounded by ring binder volumes that hold prints of electron micrographs that formed the large collection acquired over several decades of research.

It was love at first sight when, as a second-year student at the University of Pisa in Italy, Clara Franzini saw the published images of kidney tissue that had just been imaged in the electron microscope for the first time. She was immediately taken: “They are quite artistic!”

More than 60 years later, Clara Franzini-Armstrong, PhD, is a legend in the field of electron microscopy, and an institution at the University of Pennsylvania, where she first joined the faculty in 1975. And she’s still in love with microscopic imaging, specifically of muscles, both for the beauty of these images to which she has devoted her career, and for the secrets that these sneak-peeks into biology’s building blocks reveal.

It’s a love she has shared with countless students and researchers over the years, and now one she will share with generations to come. Known for her investigation of the organelles which deliver calcium within muscle cells during activation, Franzini-Armstrong is closing her lab, and making available a selection from her archive of thousands of electron microscope images — encompassing every type of muscle in the body, from humans to invertebrates — through the open-source journal *Qeios*. “Comparative anatomy of muscle and all other systems is an essential foundation of molecular biology,” she explains. “I am hoping that the images will encourage scientists to explore new and unusual muscles.”

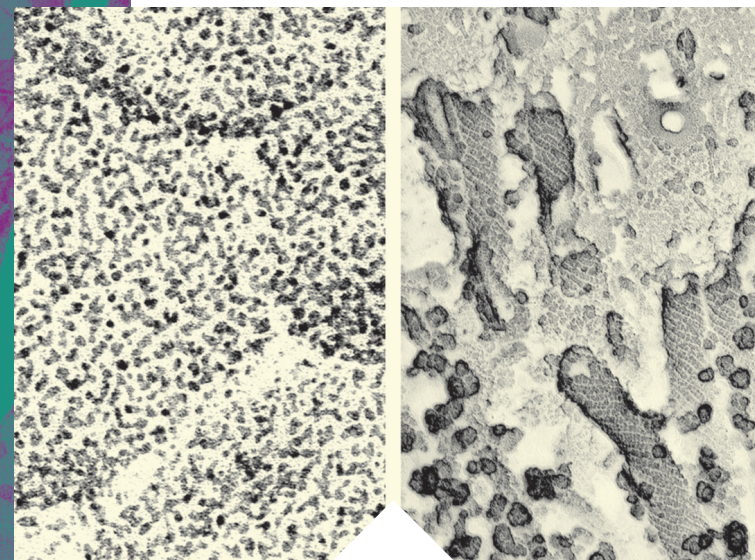
The idea was planted in 1964, when Franzini-Armstrong’s postdoctoral advisor, noted cell biologist Keith R. Porter, suggested that an album of muscle electron micrographs was worth publishing, she recalls. “About 50 years later I finally did it. I know that he is very pleased, wherever he is.”

Although Franzini-Armstrong has technically been retired for 16 years (as emeritus professor of Cell and Developmental Biology), she remained a member of the Pennsylvania Muscle

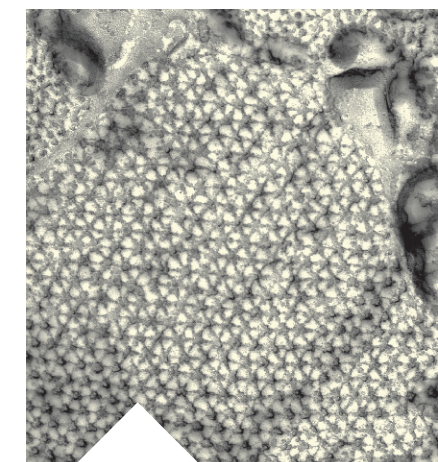
Institute and never quite gave up her studies. But now at 84, she’s ready to officially leave the lab; as she puts it, “I feel entitled to sit back and enjoy other people’s work.”

Across decades and thousands of images, Franzini-Armstrong still delights in each glimpse into the mysteries of muscular structure and function. She hopes others will look at her legacy and feel the same excitement: “The main motif through my work is that muscle is beautiful and although we think that we know all of it, surprises are around the corner.”

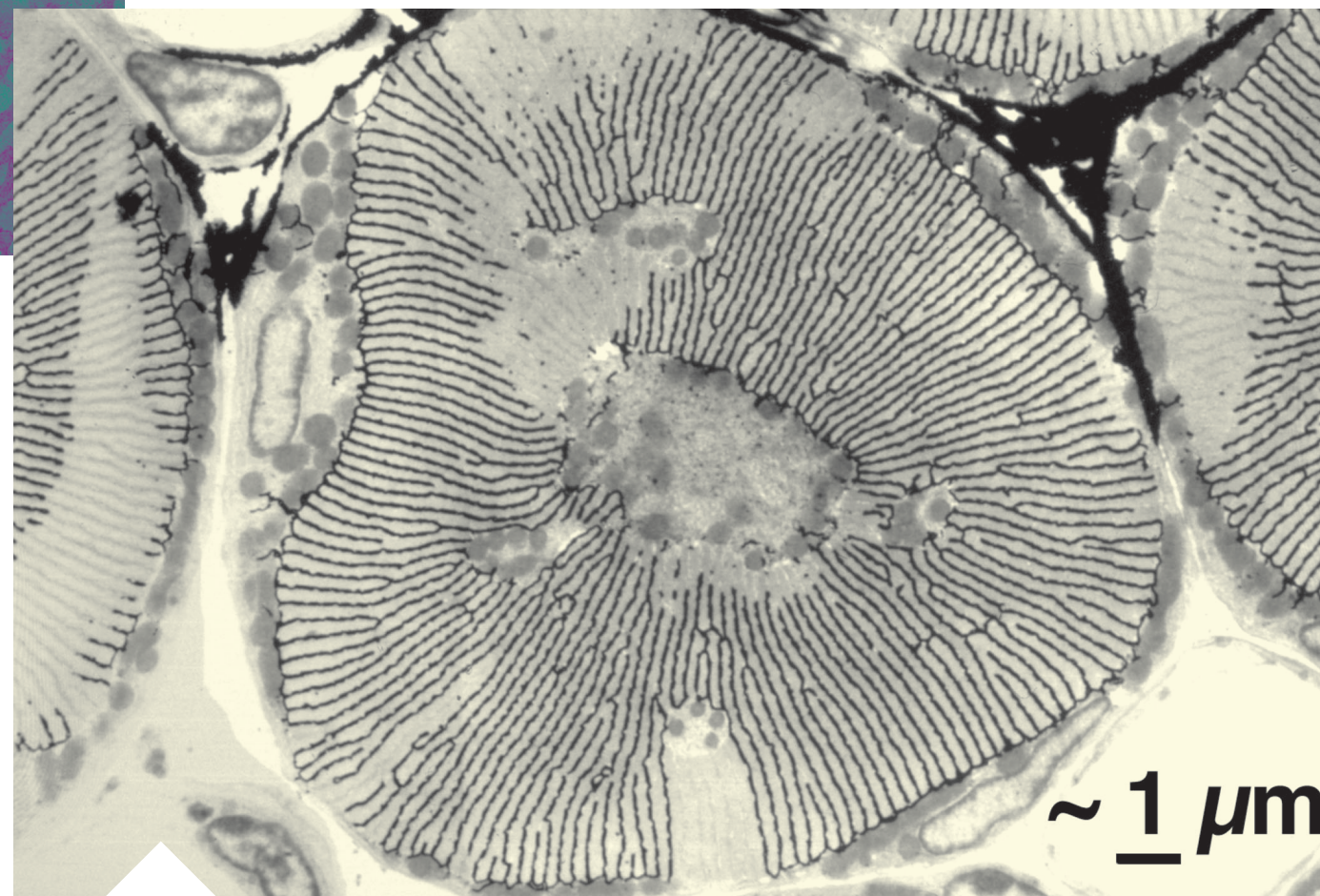
► **Find this story and access Franzini-Armstrong’s image archive online via [PennMedicine.org/magazine/MuscleMemories](https://PennMedicine.org/magazine/MuscleMemories)**



**The patterns and shapes of calcium in muscle:** The sarcoplasmic reticulum (SR) embedded in the membranes of muscle cells is essential to storing and pumping calcium ions when a muscle contracts. At left, the surface membrane of SR from a rabbit shows a large number of calcium pump proteins. The dots are the extensions of individual molecules from the cytoplasm. At right, in a scallop’s muscle cell, the calcium pump proteins form a semicrystalline arrangement. As a result, the SR components form a tubular shape.



**An orderly hop:** In skeletal muscle from a frog, the filaments of contractile molecules that form the sarcomere are highly ordered due to an extensive arrangement of cross links.



**Toadfish tubules:** Transverse tubules (T-tubules) are like a broadband-speed connection between the interior of a muscle cell and the exterior, making rapid ion exchanges when the muscle contracts. The extensive network of T-tubules seen here in the super-fast sonic muscle cells of the toadfish is typical of a fast muscle.



# Insight, In Hand

By Karen Brooks

An integrated four-year ultrasound curriculum helps Perelman School of Medicine students build competence and confidence in the classroom and the clinic.

A couple of years ago, Wilma Chan, MD, EdM, was reviewing discharge orders for a young patient as she began a shift in the emergency department at the Hospital of the University of Pennsylvania (HUP). The woman was experiencing heart palpitations and chest discomfort but had no significant medical history, and after a negative work-up the attending physician from the prior shift had approved her to go home with instructions to follow up with her primary care doctor.

A second-year medical student on rotation asked Chan if she could do an ultrasound on the patient to see if it may add insight into the cause of her symptoms — and discovered that her heart was surrounded by fluid and struggling to function. Chan stopped short.

“Cardiology urgently took her to the lab to have a drain put in and asked me, ‘Why did you do an echo on a young, healthy person with no known medical problems?’” Chan recalls. “I was proud yet humbled to tell them it was our student who’d done this and set the patient’s care and treatment on the right course — and ultimately led to the diagnosis of her underlying disease.”

Proud and humbled — but not surprised. Chan, an assistant professor of Emergency Medicine, leads the Perelman School of Medicine (PSOM)’s longitudinal ultrasound curriculum, which is fully integrated with instruction across disciplines. It has been growing steadily since its inception in 2015 when Chan was hired as director of ultrasound education.

Across their first three semesters before they begin clerkship rotations in the hospital, today’s students have 22 hours of small-group ultrasound instruction covering device use and image interpretation. Hands-on training continues throughout several of their clinical rotations, and during their fourth year, some pursue a month-long elective emergency medicine ultrasound sub-internship that has become so popular, enrollment is now granted by lottery. This extensive exposure to ultrasound technology is designed to benefit students and patients alike.

“There’s a difference between seeing something in a book and seeing it in a dynamic, living person,” says Nova Panebianco, MD, MPH, an associate professor of Emergency Medicine and director of emergency ultrasound at HUP. “Ultrasound education can give students a stronger understanding of anatomy and physiology and reinforces the points included in other parts of the curriculum.” When it comes time to care for patients, she says, appropriately trained medical students have the potential to make more accurate diagnoses, perform safer procedures, and communicate more effectively with patients — and the training improves their confidence every step of the way.

## A Sound Foundation

An experience when she was a medical student spurred Panebianco’s commitment to mastering ultrasound. During her emergency medicine rotation, she evaluated a woman complaining of shortness of breath — a symptom initially attributed to her history of asthma.

“I knew as soon as I put a probe on her that she had a life-threatening condition. She couldn’t breathe because of pain caused by a belly full of blood from a ruptured ectopic pregnancy,” Panebianco says. “That case sealed my conviction that ultrasound was something I was going to get good at.”

And she did, later completing, then becoming director of Penn’s emergency ultrasound fellowship. While in that role, she lobbied for PSOM to incorporate ultrasound into its medical school curriculum, citing the technology’s numerous advantages. Unlike other clinical imaging options, ultrasound is safe in that it doesn’t subject the patient to ionizing radiation, can be easily repeated as needed over the course of the



patient's evaluation and care, and can be performed at the bedside, including in the emergency department — reducing the need to move a potentially unstable patient or spend time transporting them for radiology testing. Ever-shrinking probes that can connect to smartphones are driving the adoption of point-of-care ultrasound (POCUS), or the use of ultrasound wherever a patient is being treated — whether it's in their hospital room, in an ambulance, or even outdoors. Using POCUS helps clinicians safely monitor the progress of procedures that were traditionally performed blindly and helps them diagnose a range of conditions swiftly and with improved accuracy.

Panebianco credits Anthony Dean, MD, now an emeritus professor of Emergency Medicine, for the advocacy, teaching, and research that expanded POCUS within the department.

He developed the emergency medicine resident POCUS rotation, in 2004 created one of the first emergency medicine POCUS fellowships; this work created the foundation for expansion of POCUS outside of Penn Medicine's emergency department. Subsequently, it was the vision of the late radiologist Harvey Nisenbaum, MD, then the chair of Medical Imaging at Penn Presbyterian Medical Center, that helped convince colleagues to apply for and secure the \$1 million Benjamin and Mary Siddons Measey Foundation grant that allowed PSOM to purchase equipment and kickstart a program for medical students. Panebianco designed 10 pilot sessions for second-year students in spring 2015, with Division of Emergency Ultrasound faculty and fellows leading each training.

"At the time, we didn't have a large pool of people who could teach POCUS, and members of the division really

Photo by Peggy Peterson

Nova Panebianco, MD, MPH, at right, leads a didactic session in ultrasound in the Emergency Medicine department at HUP.



Photo by Megan Tidmore

Wilma Chan, MD, EdM, leads the ultrasound education curriculum that is integrated through all four years of medical school at Penn.

stepped up, teaching four-hour sessions over and over. Without their passion, this curriculum never would have happened," says Panebianco, who received the PSOM Special Dean's Award with Nisenbaum in 2015 for their efforts.

The pilot's success, along with remaining Measey funds, enabled PSOM to recruit a dedicated faculty member to formalize the program. Chan, an emergency medicine physician with a master's degree in education emphasizing technology and innovation, was an ideal fit and accepted the daunting challenge of coordinating ultrasound-related activities for 160 first-year and 160 second-year students. She began integrating sessions into existing courses and soon hired veteran sonographer Christy Moore to help develop and teach lessons across a remarkably broad swath of the curriculum.

In recent years, many medical schools across the country have added ultrasound to their students' early training. The technology's clear advantage over other clinical methods — including sometimes even a standard physical exam — is that it is noninvasive, and even a totally inexperienced user is unlikely to cause harm. But while some schools hand first-year

students a probe as an early preview of applied medicine, Penn's curriculum gives medical students a broader and deeper training in an essential skill for future physicians.

"In the pre-clerkship space, the most obvious places to teach ultrasound are anatomy and physical exam, and that is where most schools fit it in," Chan notes. "We wanted to integrate it into even more aspects of classroom learning, like in embryology and microbiology, where we introduce the concept of ultrasound before students even touch a probe."

One of the unique elements of PSOM's ultrasound curriculum is that it was designed from the start to be integrated with the rest of the curriculum, notes Dennis Dlugos, MD, MSCE'02, the associate dean for Science and Discovery Curriculum, who looks for ways to correlate basic science principles with clinical scenarios in students' pre-clerkship learning. "Every course has a built-in link to ultrasound," he says.

Ultrasound even in a microbiology course, which focuses on bacteria and viruses? Absolutely, says Chan: "Students review images, identify conditions, and talk about interventions. They get so excited when they can recognize something in an image and test their clinical decision-making skills."

Michael Abboud, MD'14, MSEd'20, an assistant professor of Emergency Medicine who teaches PSOM's first-year microbiology course, emphasizes that knowing how to interpret images helps students understand how diseases impact the body.

"My job is not to teach students to be microbiologists. My job is to teach them what they need to know from microbiology to take care of patients," Abboud says. "Ultrasound connects what's important to know as a microbiologist with what's important to know as a budding physician. It takes us to the human side of microbiology, in addition to the bacterial side."

Once they begin hands-on POCUS training, students cover 17 clinical topics over their first three semesters in sessions integrated within the curriculum so they can see the organs they are studying function in real time. Standardized patients participate in some of these classes so students can have structured, supervised practice of their hands-on skills in a simulated environment but on real people, and students also practice ultrasound on their peers and simulate some procedures, like ultrasound-guided IV insertion, on medical manikins.





Photo by Megan Timnor

Above: Taylor Daniel, an ultrasound teaching assistant and fourth-year student, shows an image to Christy Moore and a faculty member. Opposite page: A second-year medical student practices on a standardized patient as part of an ultrasound “boot camp” session.

Learning to acquire and interpret images takes so much practice that Chan and Moore still hope to add more sessions in the coming years.

“A lot of people think ‘Oh, I can do that — just let me just put the probe down [to start scanning],’” Moore says. “But that’s not how it works. They might see an image and recognize, ‘That’s a baby,’ or, ‘That’s a beating heart.’ But if I ask them to [capture a clear view of] that image? They don’t even know where to start.”

## Signs Within Snowstorms

Chan says virtually no medical students come in with ultrasound experience, and many of them initially struggle, feeling awkward and frustrated. “These are brilliant, top-of-their-class students, and learning ultrasound is not mastered quickly,” she says. “It requires repetition and pattern recognition — both of which take a lot of time.” But by their second semester, they get the hang of it, and by the end of their third, “you

cannot stump them with any image. The evolution [from frustration to proficiency] is repeated again and again, year after year.”

Ultrasound involves three distinct skills: knowing the indications and limitations of the technology, performing the scan, and interpreting images. The second and third can only be gleaned through repetition, Panebianco explains.

“When students first look at an image, it is a snowstorm. How do you translate a snowstorm into meaningful information? That’s about time more than memorization,” she says. “So is developing the psychomotor skill of using the probe to create that image. Time to accomplish this is what the curriculum provides.”

All that time helps prepare students to go out into the wards halfway through their second year, and their interactions with Chan and Moore don’t stop there. Ultrasound activities are scheduled into emergency medicine and medicine core

Photo by Peggy Peterson





Photo by Peggy Peterson



In December 2021, second-year medical students practiced image-guided needle insertion shortly before they began their first clerkships.

clerkships and pop up in varying degrees throughout other rotations. During the coveted ultrasound sub-internship elective, one student per month scans patients for 200 hours, pursues a lofty goal of logging 100 reviewed scans, attends weekly image review sessions, and presents an ultrasound-related lecture.

“Wilma and I have more interaction with students than most instructors, who generally only see them for their specific block,” Moore says. “The students meet with us over their four years here, and they always tell me they love seeing a familiar face.”

These relationships extend beyond graduation, with alumni reaching out frequently to discuss their cases. John Li, MD’20, now an emergency medicine resident at Northwestern University, identified a rare and dangerous type of ectopic pregnancy called a cornual pregnancy in a patient last fall. He remembers feeling confident in his diagnosis but still texted images to Moore to confirm she concurred.

“I was the only person on my team that day who had the ultrasound skills to recognize a cornual ectopic,” Li remembers, ascribing his grasp of those skills to his PSOM education.

“It was one of those sobering moments when you realize if you didn’t know what you were doing, this patient very well could have died in the emergency department.”

Instead, she was discharged in two days and made a full recovery.

## Students as Teachers

When facing a particularly “hard stick” when trying to insert an IV, nurses sometimes call on residents. That’s what happened last year when third-year student Molly Crowe was rounding with an intern who lacked confidence in his IV insertion skills.

“The intern, who had not gone to Penn, asked if I would try it first,” Crowe says. “And because we’d practiced simulated ultrasound-guided IVs as MS2s, I got it — which was awesome.”

Crowe remembers squinting at the first ultrasound image she examined during her first semester, describing it as “a fuzzy black and white TV.” Now, she’s poised to teach POCUS

Photo by Peggy Peterson



First-year medical students Gavin Turner and Anh Dang practice using a portable ultrasound device on themselves to review information they learned in class about the body’s systems.



# A Signature Confluence of Medical Innovation and Education

Vernon and Shirley Hill aren't new to advancing innovation through philanthropy. Long-time, devoted supporters of Penn's School of Veterinary Medicine, their most visible contribution is the Vernon and Shirley Hill Pavilion — supporting construction of the building itself as well as the research and instruction taking place inside. They also clearly embrace Penn's education mission by creating the Penn Vet World Awards and the Marshak-Hill scholarship for Penn Vet students pursuing an MBA at The Wharton School.

"A commitment to innovation defines who we are at Penn Medicine, and not just in research and clinical care," says J. Larry Jameson, MD, PhD, dean of the Perelman School of Medicine and executive vice president of the University for the Health System "Acquiring Butterfly ultrasound devices for our medical students is just the confluence of medical innovation and education that the Hills are known for, right in line with that mission." What made that opportunity possible was the Dean's Innovation Fund: established in 2016, it provides immediate, discretionary resources that the dean can direct towards the boldest ideas at the Perelman School.

"By putting these portable ultrasound units into the hands of our bright young medical students, the Hills' gift answers the critical need for medical equipment in education," says Suzi Rose, C'77 MD, MEd'78, senior vice dean for medical education at the Perelman School of Medicine. "Technology can often be an ingenious way to further empower our students and trainees, and Vernon and Shirley Hill's support of the Dean's Innovation Fund has allowed us to continue integrating the latest technological advances into our preeminent medical school curriculum."

Penn Medicine is also benefiting from Vernon Hill's considerable experience and insight as it forges relationships in London, as he graciously agreed to serve on the Penn Medicine London Advisory Council. He was recently named CEO of Republic First Bancorp and has co-founded many businesses over his remarkable career, including Commerce Bancorp, Inc., and Metro Bank PLC, a retail bank headquartered in London which was the first new high street bank to launch in the United Kingdom in over 150 years.



Former Wharton Dean Geoffrey Garrett, Shirley Hill, Vernon Hill, Dr. Robert Marshak, Margo Marshak, and Penn Vet Dean Joan Hendricks, pictured at a 2018 celebration of the Hills' gift to a Penn Vet/Wharton program.

The handheld Butterfly iQ+ ultrasound devices, purchased with a gift from the Hills, can be attached to a smartphone or tablet.



to first- and second-years next fall, after finishing her current year of research.

A shortage of POCUS-proficient faculty instructors has hindered curriculum growth at institutions nationwide, and PSOM students' skill sets have surpassed those of many practicing physicians. In spring 2019, after they both completed the ultrasound sub-internship as third-years, Li and his classmate Megan Chenworth, MD'20 (also now an emergency medicine resident at Northwestern), proposed a student-led "ultrasound teaching corps" that would relieve Moore and Chan from running every lesson themselves.

The format they devised has endured. With Moore and Chan supervising and coaching, ultrasound trainings are now led by third- and fourth-year teaching corps members — five "chiefs" who have done the intensive sub-internship, plus 10 teaching assistants the chiefs have selected from a group of peer applicants.

The toughest part of teaching ultrasound, asserts Chan, is resisting the urge to grab a learner's probe when they are struggling.

"To give feedback without touching someone's hand, you have to know exactly what you are seeing and how to make corrections with just a verbal interaction," she says. "That is a fellowship-level skill, and it's something our student-instructors are already great at."

Determined to keep honing students' skills even at the height of the COVID-19 pandemic, Chan and Moore lobbied PSOM's senior administrators to approve on-campus ultrasound instruction during the fall 2020 semester, when most pre-clerkship courses were being taught virtually. Overhauling their usual large-group format, they divided classes among 10 different rooms with separate peer instructors. Since standardized patients from the community could not join them onsite, fourth-year students stood in as models.

"You cannot learn ultrasound virtually. You just can't. So we worked really hard to figure out how to get students into the building safely and how to teach them safely. Everyone wore head-to-toe PPE," Moore says, adding that nobody in the sessions contracted COVID.

Teaching corps members don't just teach fellow students; they also teach faculty — including last December in a student-led POCUS CME session during which facilitators encouraged physicians from numerous specialties to "test drive" probes and consider ways they could fit ultrasound into their courses.

"The intentional consequence of this curriculum is that students are taking this knowledge to the wards, and then faculty see the value in this skill set and want to learn more themselves," Panebianco says. "Students push faculty to learn, rather than the other way around."

During his third year, Li also joined classmates Will Piwnica-Worms, MD'20, and Ryan Zahalka, MD'20, in launching SonOlympics, a student-led, gamified ultrasound skills review

for MS2s that continues to take place annually before they begin their clerkships. The peers modeled the event after SonoGames, a national ultrasound competition the Society for Academic Emergency Medicine hosts for emergency medicine residents, and SonoSlam, a similar student competition presented by the American Institute of Ultrasound in Medicine. SonOlympics participation is voluntary, but dozens of PSOM students compete every fall, often in costume and with clever team names — like 2021's "Ultrasound of Music" and "L'Eggo My Echo."

## Smaller Size, Bigger Impact

A while back, a man came to HUP's emergency department complaining of a persistent cough and shortness of breath. His family physician had prescribed antibiotics twice, but his symptoms worsened. A medical student on duty as an ultrasound sub-intern put a probe on the man's chest, then ran to get Panebianco, the attending physician.

"There was this gigantic mass that was obstructing the flow of blood every time the patient's heart was beating. It turned out he had cancer with extension of the tumor to the heart," Panebianco explains. "This guy had been treated with antibiotics and given an inhaler, but nobody had ever looked at his heart. It was a medical student who picked it up."

Critical discoveries like these can now be made at the bedside in any department, not just in the ED, thanks to the miniaturization of ultrasound technology. Cart-based machines weighing hundreds of pounds and requiring electricity to operate have given way to battery-powered transducers that fit in clinicians' pockets and connect to tablets or smartphones.

Recognizing the value of training students on the most advanced tools, late last year, benefactors Vernon and Shirley Hill connected with PSOM Dean J. Larry Jameson, MD, PhD, and made a contribution to the Dean's Innovation Fund to purchase 60 handheld Butterfly iQ+ ultrasound devices. In January, students doing their medicine clerkships began carrying one of these Butterflies at all times; previously, instructors and students relied on 10 cart-based machines and half a dozen handhelds.

"The portability component is groundbreaking," says Chan, noting that devices not in use by students are available for loan to physician-educators from any specialty. "Instructors from all over campus ask to borrow our cart machines, and then they are stuck wheeling them across the building, maybe down Locust Walk. That is not a fun thing to do. Now, they can carry 20 in a case as opposed to pushing one at a time."

The device's mobile app links to a secure cloud network, allowing images to be stored and shared instantly, which Panebianco says is transforming medical imaging.





Medical students practice during the MS2 ultrasound "boot camp" in December 2021.

"I love the donors' recognition that even though ultrasound is not new, this is a disruptive technology," she says. "The fact that they see this innovation — and have provided the support to ensure we can appropriately train PSOM students — is incredible."

## More Than Baby Pictures

As part of HUP's Rapid Response Team, Cameron Baston, MD, MSCE'18, a pulmonologist and assistant professor of Clinical Medicine, jumps into action when a hospitalized patient has an emergency. Recently, he was called to examine a postoperative patient who was gasping for breath. Baston grabbed his "scanny pack" and ran to probe the patient's chest for a possible collapsed lung — but when he got to the bedside, a PSOM student was already doing it.

"It's been demonstrated over and over throughout my career that the ability to rapidly make a diagnosis changes the clinical course for a patient, even in the most highly resourced hospitals," Baston says. "And this culture change has started to happen here, where rather than waiting, the medical student knows what we need to do," Baston says.

"The way Wilma and Christy have designed things, nobody's being told ultrasound should replace other skills. Instead, they are taught how to integrate ultrasound into the physical exam, the history-taking, and the clinical problem-solving they are learning throughout medical school. Then, when they go into practice, they know how much to use and trust each information stream they have."

Last fall, while rounding with Baston in the intensive care unit, fourth-year student Vivek Nimgaonkar saw firsthand how often POCUS is used to complete everyday tasks — like assessing patients' fluid volumes by observing pulsations in their internal jugular veins.

"Volume assessment can be challenging — a brilliant cardiologist and a brilliant nephrologist can totally disagree about the degree to which there is extra fluid in a patient," says Nimgaonkar, who is going into internal medicine. "Dr. Baston emphasized that with ultrasound, this is super easy to do. It's a real illustration of how ultrasound can be used on a day-to-day basis."

Nimgaonkar admits that before enrolling at PSOM, he had no idea how extensive POCUS's applications were, noting, "At first, I frankly thought it was a little bizarre that Penn was so hyped about ultrasound. I didn't have any context to

appreciate that it could be used beyond obstetrics. I was wrong — it serves the field of medicine as a whole."

The presence of student sonographers can influence patient care significantly, says Nadia Bennett, MD, MEd'18, an associate professor of Clinical Medicine who also serves as associate dean for the Clinical and Health Systems Sciences Curriculum at PSOM — meaning she oversees the clinical curriculum for medical students. Bennett is an enthusiastic supporter of increasing students' POCUS training, working closely with Dlugos, who champions the inclusion of ultrasound in basic science learning.

Once students wielding POCUS devices arrive on the wards for their clerkships, "for a hospitalist like me who doesn't use ultrasound very well myself, has been amazing," Bennett says. "They are becoming indispensable," she says. "Diagnostic accuracy is important to everybody in every specialty. We make important clinical decisions based on what we see on ultrasound. I wish I'd had it during my own training."

Physicians seeking specialized experience can pursue Penn's ultrasound fellowship program, which is housed under the Department of Emergency Medicine but accepts applicants from various areas (the five current fellows span Emergency Medicine, Internal Medicine, and Family Medicine). When overseeing the fellowship before she became director of the Division of Emergency Ultrasound, Panebianco also encouraged teaching and mentoring relationships with Surgery, Critical Care, Nephrology, Trauma, Pediatric Emergency Medicine, and more in recognition of the number of physicians who'd begun adopting ultrasound technology.

"In Emergency Medicine, we adopted ultrasound because time is our most valuable resource. But our fellowship is unique in that it offers collaborative training across multiple specialties," she says.

POCUS has proved particularly useful throughout the COVID surges of the past two years. Transporting patients suspected of having the virus to get X-rays or CT scans often is not feasible or optimal for safety, and pulmonary ultrasonography enables clinicians to quickly identify "COVID lung" — an indicator of infection in the form of thickened or irregular pleural lines — and get patients to the best departments for care. Similarly, a point-of-care echocardiogram can promptly detect the cardiac complications commonly associated with the novel coronavirus.

Pandemic or no pandemic, Panebianco says that whether it's performed by a student or a physician, POCUS fosters meaningful bedside connections between providers and patients: "You can tell someone, 'Your heart isn't pumping as well as it should.' Or, you can turn the screen toward them and point out, 'This is your heart, and this is what it's doing, and this is why you need to take your blood pressure medication and your diuretic.'"

## Learning and Growing

An influx of new devices, the backing of senior administrators, and instructional collaboration from her "teaching corps" have left Chan more motivated than ever to grow her curriculum. Either she or Moore attends every PSOM ultrasound session, whether they are actively teaching or there to supervise, and they meet weekly with course representatives whose feedback they incorporate into the following year's lessons plans. Each fall, they coordinate content, timing, location, instructors, and standardized patients for pre-clerkship sessions involving 320 students, since both first- and second-years are in the classroom (in the spring, second-years move into the clerkships) — but they always want to do more.

"I want our students to be comfortable and confident going into the wards knowing how to handle probes and machines and how to take care of patients in any setting, even if it's resource-limited," Chan says.

Chan is equally focused on equipping her students to train others in ultrasound technology.

"Personnel is the biggest resource gap we have," she explains. "I need 10 more Christys of her same caliber, because our program is not just about having machines. It's about machine-to-instructor ratio. Students can't teach themselves, nor can one person teach this effectively to 20 people at a time."

As associate dean for curriculum, Bennett supports the idea of enhancing the program.

"I see opportunities to expand these experiences during clerkship years as we think about more specialty-specific clinical training," she says, adding, "If we can get more resources, hopefully we could expand the ultrasound sub-I elective to more students, since it is such a highly rated experience."

After finishing that elective last December, Nimgaonkar, who came into PSOM incredulous at the school's emphasis on ultrasound, declared the curriculum among its greatest strengths.

"All this exposure is going to be so valuable in my career and will help me deliver the best possible care to my patients," he says. "The full scope of the use of ultrasound is still evolving, and the greater comfort level you have with the technology, the greater your potential is to identify where it could be used in a novel or creative way. Penn has had the vision to see that ultrasound is only going to become more important in the coming years, and I am just so grateful to everyone involved." ◻

► Find this story and a related video online at [PennMedicine.org/magazine/ultrasound](https://PennMedicine.org/magazine/ultrasound).



# Tuesdays at the Love Lot

By Rachel Ewing and Daphne Sashin  
Photos by Peggy Peterson

In the Philadelphia neighborhood hardest-hit by the opioid crisis, a Penn team stepped up to provide free COVID testing.

It was early June 2020 when they first loaded their van with a pop-up tent, folding tables, masks, hand sanitizer, and a cooler full of testing chemicals. That week, temperatures were rising. In more affluent parts of the city, storefronts were being boarded up to prevent damage amid protests against racial injustice. COVID-19 had only just crested its first wave, and three Penn Medicine staff members had joined together to bring free testing to a community already under siege from a different, long-simmering crisis: opioid use.

This was a new collaboration, just built a month earlier through the trio's mutual connection: Benjamin Abella, MD, MPhil, a professor of Emergency Medicine. For the first year, the three of them were in Kensington, a neighborhood east of North Philadelphia, every Tuesday, arriving in the mobile CPR van that Nabil Abdulhay, MPH'22, previously used for his outreach job in Penn's Center for Resuscitation Science. Joining him was Antonio Davila, PhD, the laboratory director in Penn's Acute Research Collaboration (PARC) who had never worked with infectious diseases or face-to-face with patients before; it was thanks to his ingenuity that they had home-grown PCR tests now while clinical tests remained in short supply. The final member of the trio, Rachel McFadden, BSN, an emergency medicine nurse at the Hospital of the University of Pennsylvania (HUP), already knew how to de-escalate tough situations and how to meet people where they were — even if they were in the lowest moments of their lives, having lost their homes, families, jobs, and more to drug use. They would need all of those resources and skills for their work together.

The world the Penn group now entered was one that McFadden and Abdulhay already knew — they'd both volunteered for years with Prevention Point, a nonprofit embedded in the community that is focused on empowerment, health, and safety for people who are affected by drug use and poverty. For his part, Davila was eager to jump in and help marginalized people, especially low-income Latinos who reminded him of where he'd come from.

The needs here are vast. Once an ordinary working-class neighborhood, over the last decade Kensington has become one of the largest hubs of the illicit opioid drug trade in the northeastern United States. The streets are home to hundreds of unhoused individuals, many of them in active substance use, many with medical comorbidities.

In tight quarters with few resources, this was a community at risk of being left behind and left out of newer forms of relief as the COVID-19 crisis unfolded. The Penn team reasoned that with very little money and a lot of dedication, they could make a difference by offering free tests. Along the way, with a short research survey, they hoped to gain some insight into how the pandemic was changing access to food, employment, and safe shelter — if people already at the edge of a cliff were in more danger of falling off, could the team learn how to save some of them?

And so the trio began driving to Kensington. Sometimes together, sometimes separately. At first every Tuesday, then three days each week when they got more funding. And they've kept going for nearly two years. Their story together makes up the Penn COVID TRACE project — for Testing, Resources, and Community Engagement.

"Whether it's 110 degrees or 20 degrees, we are outside doing this every week," McFadden says. "We were lucky because we got such a great team together. But also, the work feels very meaningful in a way that's different from other roles that we have and other things that we do."

Rachel McFadden, BSN, is an Emergency Medicine nurse at the Hospital of the University of Pennsylvania and longtime volunteer with Prevention Point in Kensington.





Rose, 54, became addicted to opioid painkillers after abdominal surgery. She comes to Prevention Point almost every day.



## Only Compassion and Help

“I’m 54 years old. I’m a mother and a grandmother and a wife. I’m an RN.” These are the first things Rose says when she’s asked to share her story one day late in the winter of 2022 while she waits in line for a COVID test in a tent outside of Prevention Point. She wants you to know that drug use doesn’t define her.

“A lot of places treat you like garbage once they know you’re a junkie,” she says. Here, there is only compassion and help.

Rose used to work in home health care and as a certified eye bank technician. She would go to hospitals and funeral homes collecting corneal eye tissue for transplant. That’s not her life these days, though.

“When I was 33, I had gastric bypass and three other major abdominal surgeries. I was prescribed 700 Percocet 5s (5 mgs) in a year by the three different doctors that did the surgeries. I just kept on taking them, thinking I was in pain, but I probably wasn’t. I had a girlfriend say to me [years ago], ‘You’re not sick — that’s withdrawal! I realized I am addicted, totally.’”

Her husband is, too — he got hooked on painkillers after a car accident 15 years ago that broke his neck. They currently live in a house in South Philly that has no electricity and no water. Her adult daughter also has a substance use disorder.

Rose comes to Kensington almost every day to get a meal. It takes an hour and a half to get here on the bus. Prevention

Point usually serves food in the early afternoon, starting around 12:30.

Today, Roz Pichardo, the lead educator and community engagement coordinator, has made chili. Walking into the tent, before getting in line for her COVID test, Rose first stops at the Penn Medicine table to pick up the items being given out thanks to a grant from the city: a kit containing the drug Narcan to reverse overdoses and a warming bundle containing hand warmers and gloves tucked inside a knitted hat.

“I like this color for you!” McFadden calls out to Rose as she puts on the blue and yellow hat.

Rose adds the other items to her reusable shopping bag along with containers of food and a bunch of bananas Prevention Point has given her. Another bag she carries, a plastic one, has paper bags inside. They hold sterile syringes. Each week she collects dirty “works” around the neighborhood and turns them into the Prevention Point syringe service for sterile ones.

Rose has come to get tested about 10 times, she says. She had COVID about a month earlier and wants to confirm she’s still negative. She can’t go inside her methadone clinic if she’s positive for COVID. She explains that even though she’s on methadone to treat her drug use, she still does a couple bags of fentanyl a day. (“The methadone doesn’t block it. It’s like a super drug.”)

She says she got her COVID vaccine here last summer.

“It’s very convenient. Everybody’s friendly. They welcome you with open arms and treat you like a human being.”





# The Love Lot

A coalition of programs and services started coming together at the Love Lot in the spring of 2020. Before COVID-19, Prevention Point ran clinics and syringe services five days per week and offered much more — case management, HIV testing and treatment, mail service for unhoused people — in their building, a former church in the shadow of the Market-Frankford El train running above Kensington Ave. With the pandemic, they suspended some services but brought as many as they could to a large municipal parking lot a few blocks away.

The Love Lot was one of three sites across the city where the “Step Up to the Plate” partnership, launched in the earliest days of the pandemic, brought together the City of Philadelphia, Prevention Point, and other community-embedded nonprofits, to offer free food for people facing the greatest needs.

“Once you have people gathering to pick up free food, you can start figuring out what else is needed,” says Hilary Disch, communications coordinator for Prevention Point.

Prevention Point looked for more ways to help with material needs — offering free clothing, changing stations to put on clean clothes, and assistance signing up to receive federal pandemic stimulus funds. And the Love Lot quickly became one of the only safe places for public life. Outside of mealtimes, there was the “Sunshine Café” serving tea, lemonade, and

cocoa. A festive atmosphere was common, with musicians performing and artists running pop-up art-therapy workshops.

For more than a year, the Penn Medicine COVID TRACE project was one more player in this ensemble cast. It was built on the same premise of harm reduction that had been part of Prevention Point’s ethos for many years.

The Penn team offered COVID testing, for free, no appointments required, and, importantly, free of judgment — people could, and did, show up while in active substance use. In their research survey, the team asked participants a few basic questions about risk factors (in the first summer, almost 20 percent reported they’d spent time with someone with COVID), and about resources like jobs, housing, and food, in order to track any correlations with positive tests. About 30 percent of participants were living on the street, and another 7 percent in shelters. And the Penn team shared information about staying safe, whether from COVID or from overdoses, along with protective tools including masks, hand sanitizer, and Narcan.

The judgment-free zone was welcoming to people who might not seek care in a traditional health clinic.

“I truly believe interfacing with health care clinicians in that kind of harm reduction framework can start rebuilding the damaged, distrustful relationship between health care and people who use drugs,” McFadden says. “That’s kind of a big thing.”



## Grassroots to Growing Up

“I’m going to be honest, it was like chaos, it was just *get through it*,” Abdulhay recalls of the first summer of testing. “Just do whatever you can do.”

As the nurse, McFadden did all the swabbing for samples to run PCR tests — aided by a slew of dedicated nursing students from the Community College of Philadelphia, and their clinical instructor, Matthew Licchetto, RN, also a nurse at Penn Medicine, who volunteered to help.

“When it gets really busy, we need to form a line, keep things orderly,” Abdulhay adds — it’s part of his job to be the logistics ace. “That’s a challenge, and that’s where also where Prevention Point steps up. Roz Pichardo, she’s extraordinary and can very quickly turn a messy situation around.”

That whole first year, at the Love Lot every Tuesday, the team used a totally analog system for their research questionnaire and testing materials. “Everything was labeled four times for redundancy and everything was just label on label on label on handwritten surveys,” Abdulhay says.

That first summer turned to winter, and the trio still came every Tuesday. They had hand warmers but no other source of heat. McFadden’s fingers turned blue as she tried to draw blood samples for an antibody-testing part of the study that was later discontinued.

Trying to fill out the paper surveys, Davila recalls, he had to hold the pen in his armpit to keep the ink from freezing.

This type of street-level outreach wasn’t even close to Davila’s specialty. After freezing on Tuesdays at the Love Lot, he spent all day every Wednesday in his lab running the PCR



Rachel McFadden, BSN, and Nabil Abdulhay, MPH, at the Love Lot in August 2021.

tests to turn around results in 24 hours. Every piece of the test was prepared in his lab — all the solutions, everything in each tube.

Then, in May 2021, the Philadelphia Department of Public Health awarded the team a grant of nearly \$500,000 to expand their operation. Abdulhay found the time to dust off some old iPads and digitize their surveys. Bolstered by a new staff of paid assistants, the team could offer free testing three days every week. The city grant provided rapid antigen tests so that community members could get their results on the spot in 15 minutes, while they could still also opt into taking the Penn PCR test and research survey. If they chose the latter, they could earn a \$5 Wawa gift card. Some took both tests — and, often, supplies for both ran out early in the day.



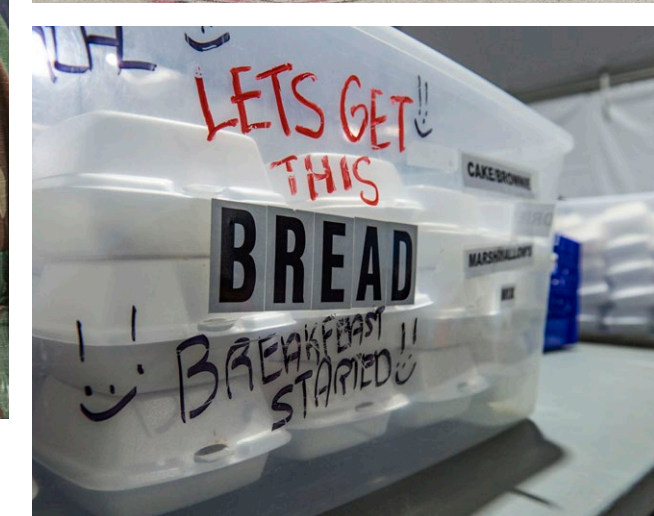




Antonio Davila, PhD, stepped outside of his comfort zone as a laboratory scientist through his work with COVID TRACE.



Rosalind Pichardo, lead educator and community engagement coordinator at Prevention Point, lives and works in Kensington.



## Assembling a Dream Team

“As a team we were always able to bring different things to the table,” Abdulhay says. “Tony runs a lab that can run all these samples. Rachel is the person who can talk to anybody under any circumstances, and I’m the guy that runs all the background stuff and can set up all the when and where.”

Remarkably, the three of them barely knew each other before the pandemic.

To start, in those early days when COVID tests were scarce, Davila got curious and a tiny bit rebellious. He kept coming to the lab when it was supposed to be shut down and he learned what he needed to run his own PCR test for the SARS-CoV-2 virus.

Abdulhay had seen his own work on Penn’s Mobile CPR project shut down — it was no longer safe to gather groups for hands-on CPR training to help bystanders save lives from cardiac arrest. In the early spring of 2020, he seized the opportunity to staff a research study looking at whether the malaria drug hydroxychloroquine could prevent COVID infection in health care workers. (They ultimately found the answer was no — it wasn’t any more effective than a placebo.) One of the study’s lead investigators, Benjamin Abella, MD,

MPhil, had overseen Abdulhay’s CPR work in his role as director of Penn’s Center for Resuscitation Science.

It was Abella, a professor of Emergency Medicine at the Perelman School of Medicine, who brought them all together. He’d also worked closely with Davila as medical director of PARC; that group did studies related to traumatic emergency conditions, ranging from blood clotting to brain injury. And Abella had worked side by side with McFadden caring for patients in the Emergency Department at HUP. He knew that both she and Abdulhay had volunteered with the syringe services and wound clinic at Prevention Point before. And so they all came together.

“The common theme for all four of us is we just really care about the community and want to stay involved,” Abella says. “One of the most commonly stated values that I put on the table is I want to be a research team that has dirt under its fingernails. I don’t want to just live in the ivory tower. You know, learning stuff is nice, but putting that knowledge and skillset to work in the community is even nicer.”

## Mama Sunshine

“People got to sit down and chill with us,” says Roz Pichardo. “This was like the only space that was okay during COVID.” Pichardo works both at Temple University Hospital, where she is an advocate for trauma victims, and at Prevention Point, where she works in education and community engagement.

Here, she’s known as Mama Sunshine because she calls all the participants “Sunshine.” It’s an endearing and universal term that everyone responds to, unlike the dehumanizing names too many people call them — like addicts, or zombies.

She’s grateful for the Penn team coming to give free testing in Kensington.

“It’s been helpful, not only for the participants, but it’s been helpful for us as essential workers,” she says. “We don’t have time to go downtown to get tested.”

Pichardo, who lives in Kensington herself, has had COVID four times and survived a bout in the ICU the second time,

before the vaccines came out. She has helped many more in her community to survive their other epidemic. In a pocket-sized black Bible, she counts them: Using Narcan, she has reversed 924 overdoses since 2018.

Since funding for Step Up to the Plate ended at the end of 2021, free meals from Prevention Point are no longer a guarantee. Yet Pichardo has been committed to making sure food still flows in, including grocery donations from another local nonprofit, SHARE Food. Often, she personally cooks and packages huge quantities of chili or macaroni and cheese.





Prevention Point runs a syringe exchange five days per week, year-round. It is a form of harm reduction, offering people who use drugs a way to do so with less risk of infection, and helping to build trust to connect with other forms of support.

## Where They Are

In the fall of 2021, a few things changed. Prevention Point and their partners shifted their meal distribution from the Love Lot to Prevention Point’s own headquarters. A large tent with clear plastic flaps sits in a parking lot adjacent to the building, more sheltered than before. And for the second COVID winter, they had heaters.

The renewal of city funding for Penn’s COVID testing program made it possible to add testing once a week in West Philadelphia in partnership with the People’s Emergency Center.

Demand for testing in Kensington has fluctuated over time — rising during the delta and omicron waves, declining in between. Despite the Penn team’s earlier concerns of potentially high COVID rates in this community, the testing program didn’t bear that out; they were reaching a group of people who avoided this disease, perhaps because most can’t afford to take public transportation and don’t congregate indoors or eat in restaurants. But the need for connection and support has been constant, and it’s central to Prevention Point’s role to be there with partners, including Penn Medicine, at their side, to reduce harm for people in the depths of a powerful substance use disorder.

“The syringe services program is the classic example of harm reduction,” Prevention Point’s Disch explains, “because we’re not telling people you need to stop using drugs, we’re saying we understand you’re using drugs, and you still deserve to stay safe and healthy. If you use an unsterile syringe, you’re more likely to develop infections. We’ve seen that if you can meet someone with an immediate need like a sterile syringe and they start to trust you, maybe they’ll be open to more services like testing for HIV or Hep C, or treatment.”

It’s a lesson that some more empathetic emergency medicine clinicians like McFadden and Abella also bring to their care of unhoused individuals in the hospital on a regular basis, too — though stigma against them and those with substance use disorder is also still common.

“These are folks who the world does not treat well,” Abella reflects. “The ability to bring them a sandwich, treat them with dignity, talk to them a little bit, and if they need a place to sleep for an hour, let them sleep for an hour before we send them out, is an act of kindness that feels like a really important thing because they don’t get this very often in their existence, unfortunately.”

## Where They’re Going

For some among the trio Abella brought together, who have shown up every week in Kensington for nearly two years, the experience has been transformative. Yet they are all a little unsure about what lies ahead, as the city’s funding for their testing program was slated to run out after this May.

McFadden is connected to this community no matter what; she’ll keep working at the front lines in HUP’s Emergency Department and volunteering with Prevention Point as much as she can.

At the Love Lot, Davila was pushed out of his comfort zone in the lab. He had wanted to help, but he thought his role was lending his hand to a research study. Face to face with real people in dire straits, he had a realization: “We weren’t really a research project. We were a service.”

From that point forward Davila’s priority wasn’t the data they’d collect, but what they could collectively do to help people — from testing to warm clothing. Meanwhile, his research lab is back up and running now after the early COVID closure, but he’s not just returning to his old projects.

“My life has completely changed since this started,” says Davila, who’s also a faculty member in Penn’s School of Nursing. He’s envisioning public health research focused on trauma; he

wants to measure how the body responds to exposure to community violence, and how that impacts healing from injury. And he’s thinking about, beyond the lab work, how he will collaborate with community partners and spend time with the people affected by that trauma.

Abdulhay, who is completing his master’s in public health degree at Penn this spring, is still committed to the lifesaving mission of community CPR training that was once his primary job — and may be again, one of these days.

“I’d really love to return to our core CPR work and cardiovascular work,” Abella agrees. “It’s like the farmer-soldier, though. If you have to go fight the war, you fight the war and you just keep dreaming of getting back to the farm. You know, when the war’s over, I’d love to get back to what we did before COVID. But if there’s still work to be done, we’re here for it.” □

**Connecting with underserved communities to improve health is integral to Penn Medicine’s mission and vital to achieving health equity. Read more stories of Service in Action at <http://CommunityImpact.PennMedicine.org>.**

Local artists Kathryn Pannepacker and Lisa Kelley come to Prevention Point regularly to offer “art as harm reduction.” “There’s something about having a space of creativity and expression,” Pannepacker says. “It can become a mirror of despair, but also a mirror of hope and possibility.”





# A CALL TO ACTION

Lean into Change to Fulfill the Promise of Academic Medicine



To meet the challenges of the extraordinary times we are living in and improve health for all, we must catalyze change in academic medicine. PSOM Dean J. Larry Jameson delivered this message at the conclusion of his term as chair of the Board of Directors for the Association of American Medical Colleges.



**J. Larry Jameson, MD, PhD**  
Dean, Perelman School of Medicine (PSOM)  
Executive Vice President of the University of Pennsylvania for the Health System

I want to challenge you — challenge us — to accelerate needed changes in health care and science. We know the potential of the U.S. health care system. We are the innovators of most new medical advances; we have generous funding from the NIH that fuels our breakthrough basic and translational research discoveries; American biotech and pharma industries pioneer most new therapies. We have some of the finest health care facilities in the world. Nevertheless, it is a long-standing tragedy that our health outcomes lag most of the developed world.

Our business community, government, and fellow Americans are losing patience with the cost of health care delivery and challenges with access.

The sources and potential solutions to this paradox are well-known — social determinants of health, persistent health disparities, misallocation of resources, particularly relative to prevention, and a payment system that is overly bureaucratic and not well aligned with incentives to optimize outcomes at lower cost — to name just a few issues.

We cannot wait for others to address these challenges. Change will happen either with us, or to us.

Remember, each of us has the power to act locally in our own communities and in our institutions — in our classrooms, clinics, laboratories, and operating rooms. We own the culture of academic medicine.

We should remember that our profession is largely self-regulated. We created most of our policies — formal

and informal. We establish the curriculum — explicit and hidden. Therefore, in principle, we can change these policies and practices.

For example, we can decide whether to embrace more holistic criteria for promotion. We can decide whether we value team science as much as — or more than — individual accomplishments.

At Penn Medicine, we recently added community-engaged research to our formal categories for scholarship; we set explicit expectations for professionalism and review these for appointment and promotion; we expanded our education categories to embrace teaching and mentoring in practical settings like clinics, ICUs, and laboratories, as well as in the classroom.

We overtly state that we are united as an anti-racist organization, setting an expectation for our culture.

I hope — and believe — that we have reached an inflection point in the effort to root out racism and bias in medicine. Widespread outrage over racial injustice since 2020 has catalyzed an ongoing movement to effect enduring change.

After years of slow progress, we saw a major uptick in applications to academic medical institutions during the





**Innovation for access:** PSOM medical students Ginikanwa Onyekaba, Katie Krupp, Canada Montgomery, and Austin Cao are part of Penn Medicine's first-of-its-kind Center for Surgical Health, which provides navigation and support to help under- and uninsured patients receive surgical treatment before it becomes an emergency.

pandemic — that was accompanied by the enrollment of more diverse students into medical school and PhD programs.

We need to build on this momentum, and ensure that our climate is conducive to learning and positive experiences for students from a wide range of backgrounds and experiences. Embracing diversity and inclusion will help us evolve more quickly and successfully.

## BRINGING BIOMEDICAL RESEARCH TO ITS APEX

Innovation in research has been, and remains, a critical part of our relevance and our future.

I am trained as a physician-scientist. At each stage of my career, I thought we were approaching the pinnacle of biomedical advances. But we are far from the apex. Around every corner is a stunning unforeseen breakthrough — the emergence of epigenetics for regulating gene expression, the engineering of CAR-T cells to treat cancer, the use of fetal surgery to treat developmental defects like spina bifida, the development of CRISPR-Cas9 for gene editing, and the use of TAVR as a less invasive way to repair heart valves. The tools and opportunities for major research advances have never been greater. The remarkable efficacy and safety

of the mRNA vaccines against the SARS-CoV-2 virus shows how much we can accomplish.

These types of advances can rarely be supported by academia alone.

The platform for mRNA vaccines was developed by two scientists at Penn Medicine based upon decades of basic research. But it required collaboration with government and industry to bring this technology to patients.

We can seize this moment in history to build support for translational science and quicken its pace by expanding our partnerships with industry, while being transparent and attentive to conflicts of interest, as we collaborate to find and evaluate new treatments.

In addition to the practical benefits of new therapies, these breakthroughs give our patients hope and reinforce the value of biomedical science to society.

## THE JOY OF MEDICINE

I have found gratitude and joy in each of my roles in academic medicine. I never expected to be a doctor or a scientist, much less a department chair or dean.

I find that satisfaction comes not from titles but from doing a job well and loving what I do.

I vividly recall a clinical experience as a newly minted intern during one of my first patient encounters. I admitted an elderly man with metastatic prostate cancer. He had lost weight, was listless, and bedridden. He came up from the ER with the common diagnosis of “failure to thrive.” My initial assumption was that he was in the final stages of his disease. However, his potassium level was elevated.

Somewhere from the memory banks of medical school lectures, adrenal insufficiency surfaced in the differential diagnosis.

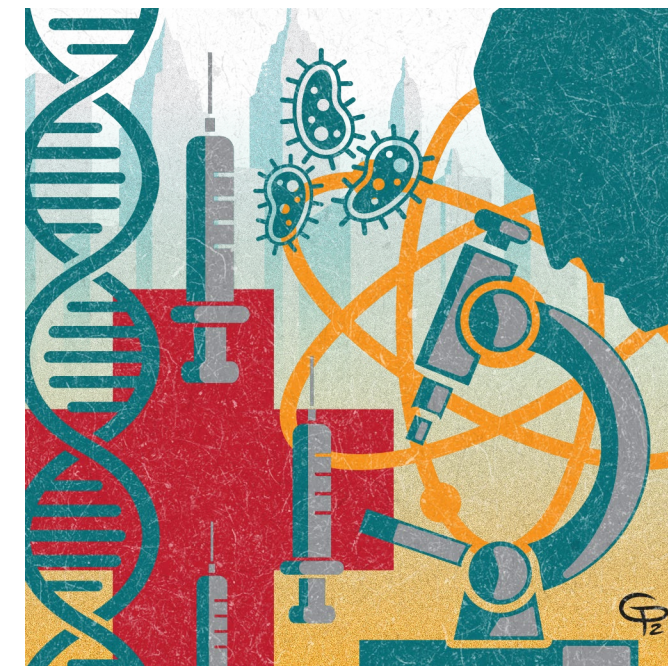
Testing confirmed the diagnosis, and cortisol replacement dramatically restored his vitality. This diagnosis may not have changed his long-term outcome, but it did improve his quality of life, and reinforced for me the power of knowledge to help people.

I know you have similar stories, and I urge you to reflect on your own memories of making a difference in people's lives.

This is the joy of medicine.

For most of my career as a physician-scientist, my work has felt more like a hobby than a job. Why else would one wake at 2 a.m. with a novel idea, get out of bed, and head into the lab to get started on the next experiment? It is thrilling when new data turns over a missing piece of an unsolved mechanistic puzzle, ultimately revealing a full picture that is beautiful to behold.

Some of these experiences feel like epiphanies and are shared with graduate students or postdocs in the relative isolation of the laboratory. Others occur during a plenary talk when a large group shares the experience of a new insight as they see the final slide with the “big reveal.”



The spirit of joy touches every aspect of our work — patient care, research, teaching, and engaging with our communities. It can also be found in implementing the changes in the culture, traditions, and practices of academic medicine that are essential to improving the health of our nation.

Research can be arduous with many failures, so we must recognize, celebrate, and remember these dopamine-rich moments of euphoria.

This, too, is the joy of medicine.

Our devotion to teaching and mentoring is arguably the greatest wellspring of joy. I am often surprised when one of my former trainees mentions something I said to them, of which I have no clear recollection, but seemingly provided a memorable pearl or changed their career plans. As you teach students, residents, or colleagues, they will, in turn, use this knowledge to manage untold numbers of patients.

For me, this is like a PCR reaction. Teaching is amplification leading to impact.

The spirit of joy touches every aspect of our work — patient care, research, teaching, and engaging with our communities. It can also be found in leadership roles and in implementing the changes in the culture, traditions, and practices of academic medicine that are essential to our future and to improving the health of our nation.

Our field needs leadership at this time, and you can find joy and satisfaction in leadership, as well as in our traditional missions. I am deeply grateful for our community's collegiality and sense of purpose.

We can meet the challenges of these extraordinary times.

We can lean into change — to improve patient access and outcomes, to create a stimulating educational environment for a broader group of learners, and to translate new scientific insights into novel therapies and cures for our patients.

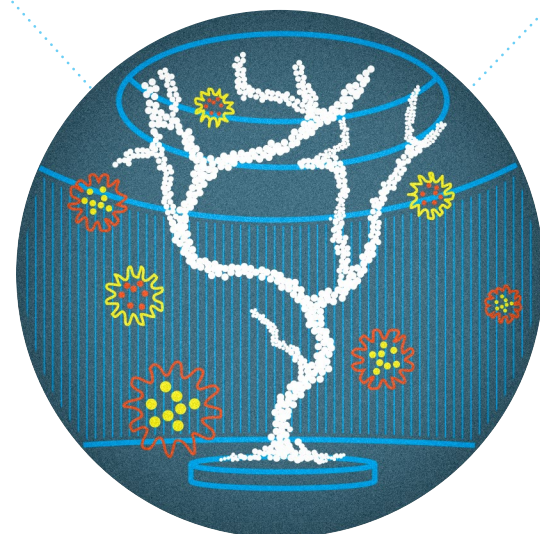
I call on each of you to join in this journey to a healthier, more equitable future — to enact the change that we know is needed to fulfill the promise of academic medicine. □

**The passages above are excerpts from the speech Jameson delivered to the AAMC's 123rd annual meeting, “Learn Serve Lead 2021” on Nov. 9, 2021. The full transcript and video are available online at [www.aamc.org/professional-development/events/learn-serve-lead](http://www.aamc.org/professional-development/events/learn-serve-lead).**



# THE POWER TO TRANSFORM PATIENT CARE

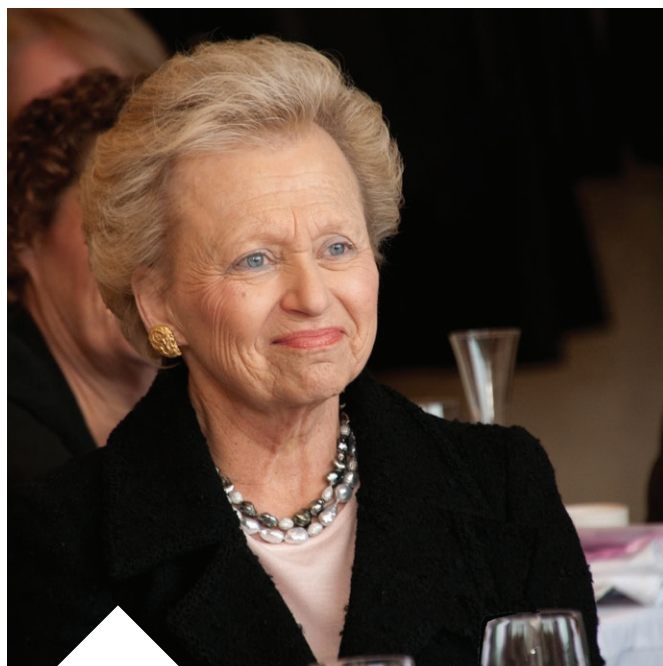
Recent Gifts from Donors with Vision—and Compassion



## Honoring a Champion of Holistic Cancer Care

Since 1997, the Abramson Family Foundation has worked in partnership with the University of Pennsylvania to transform cancer care and research. As former Abramson Cancer Center Director John H. Glick, MD, recalls, “Madlyn Abramson was an inspiration to all in the cancer community by giving back to help others. She wanted every patient facing cancer to be cared for throughout their journey, from diagnosis to survivorship — and beyond their immediate medical needs.”

That first transformative gift establishing the Abramson Family Cancer Research Institute has been followed by additional commitments which total more than \$163 million, including a new generous \$10 million investment in the



Madlyn Abramson

Abramson Cancer Center’s research enterprise. In recognition of this most recent gift, the main lobby of the Pavilion will be named The Madlyn K. Abramson Lobby in honor of Madlyn K. Abramson, ED’57, GED’60, Penn Emeritus Trustee, who passed away in 2020. A place of respite and comfort for all Penn’s patients and families — and home to *Decoding the Tree of Life*, a sculpture designed by world-renowned artist Maya Lin — this space truly reflects the vision of compassionate care held by its beloved namesake.

Beyond attracting top scientists to Penn — which included immunotherapy pioneer Carl H. June, MD, the Richard W. Vague Professor in Immunotherapy — the Abramson Family Foundation’s philanthropy focused on recruitment of the best and brightest clinicians, social workers, psychiatrists, and nutritionists who would take cancer care to the next



level. Indeed, it is Madlyn and the Abramson Foundation’s vision that helped create a patient-centered national model that remains strong today.

“For decades and continuing today, Madlyn is such an important guide for everything we do,” says Robert H. Vonderheide, MD, DPhil, the John H. Glick, MD Abramson Cancer Center Director’s Professor and director of the Abramson Cancer Center. “What the Abramson Family Foundation has done for patients around the world, through our research, is revolutionary. That impact only will grow stronger over the generations to come.”

J. Larry Jameson, MD, PhD, executive vice president of the University of Pennsylvania for the Health System and dean of the Perelman School of Medicine, says, “The Abramson family’s dedication to our institution, our research and care teams, and — most importantly — our patients, has led to the day when we can speak the word, ‘cure.’”

“Madlyn was a believer in the power of our faculty and staff’s bold ideas and compassion. Inside the Pavilion and across every part of our health system, we are working together to build on the momentum she helped launch,” shares Kevin B. Mahoney, CEO of the University of Pennsylvania Health System.

## Finding the Keys to Treating Autoimmune Disease

Judy and Stewart Colton, W’62, are on a mission: to help researchers better understand autoimmune disease and accelerate the development of much-needed new therapies. Autoimmune diseases, where the body’s immune system attacks healthy cells, impact more than 23.5 million Americans,



Celebrating the new Colton Center for Autoimmunity at Penn

and, as Stewart Colton explains, “Finding the keys to autoimmune disease is one of the most vexing challenges in science.”

When they announced their \$10 million gift to establish the Colton Center for Autoimmunity at Penn — their third such center in the nation — the Coltons spoke of the “hope that this joint effort across all three world-renowned institutions will not only accelerate awareness for autoimmunity, but also drive further innovative research.”

Penn’s culture of interdisciplinary, cross-campus collaboration and its decades of investment in translational medicine position this new Colton Center to bring discoveries into first-in-human clinical trials. Further complementing the strengths of the NYU and Yale Colton Centers is Penn’s massive community of immunologists, the momentum behind immune health research, and the ability to produce cellular therapies in-house.

In its first year, the Colton Center at Penn will prioritize investment in human talent, deep immune profiling, and



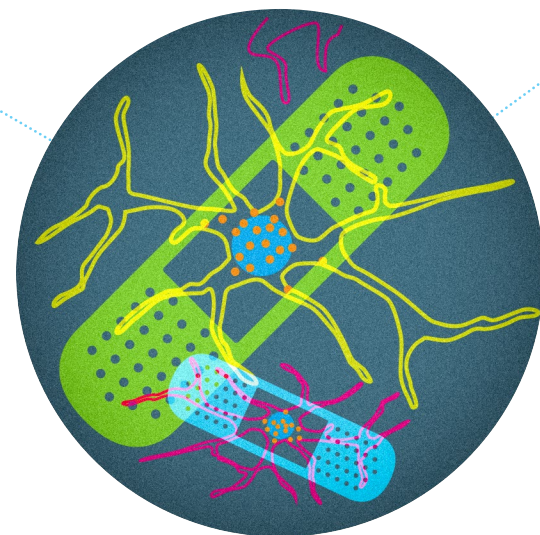


big data capacity, as well as fund up to three pilot grants. Exceptional trainees will be recognized with newly established honors: the Colton Scholar Award and the Colton Fellow Award. By building a coalition among leaders at the three Colton Centers, there will be opportunities to design and implement “Dream Team” research projects.

“We are proud that Judy and Stewart Colton chose Penn to be home to this new center and are confident it will drive a significant impact on patients and families facing autoimmune disease,” says Colton Center Director E. John Wherry, PhD, the Richard and Barbara Schiffrin President’s Distinguished Professor, chair of Systems Pharmacology and Translational Therapeutics, and director of the Penn Institute for Immunology. “We excel in developing ‘science in patients’ and bringing their outcomes back to the bench, and I’m very excited to be part of this new alliance against autoimmune disease.”



James Kim with Penn Neurosurgery Chair Daniel Yoshor, MD, on the roof of the Pavilion.



## Laying a New Road to Recovery from Neurovascular Disorders

When talking about the James and Agnes Kim Family Foundation’s \$25 million gift to the University of Pennsylvania and Penn Medicine, proud alumnus James Joo-Jin Kim, W’59, G’61, GR’63, explained, “It is with great pride that our family gives this gift. The knowledge and character I gained at Penn helped to pave the road to my success, and I hope this gift helps to pave that road for others.”

The Kim Family Foundation’s total commitment includes \$10 million to launch the Kim Family Neurovascular Surgery Program at Penn Medicine — easing the road to recovery and function for patients after stroke, brain hemorrhage, aneurysms, and other cerebral vascular malformations. “We are excited that the Kim Family Neurovascular Surgery Program will enable technological and medical advancements that will improve patients’ quality of life,” says Kim.

This funding allows the Department of Neurosurgery to establish a comprehensive platform to facilitate development of new technologies for the treatment of neurovascular disorders — from initial design to translation into patient care. In addition to a neurovascular innovation lab, the Kim Foundation’s gift will secure an endowed professorship in cerebrovascular surgery, giving Penn Medicine a powerful tool to recruit and retain top talent and expand their impact.

“I am so grateful to Jim, Agnes, and Susan Kim for their vision and generosity,” says Daniel Yoshor, MD, the Charles Harrison Frazier Professor and chair of the Department of Neurosurgery. “The Kims truly understand that technology has the great power to improve people’s lives, and the Kim Family Program will allow us to build upon Penn’s expertise across the neurosciences, engineering, robotics, nanotechnology, and cellular and molecular biology. It’s imperative to create much-needed improvements in outcomes for patients, and we’re now on the path to approaches that can preserve or restore neurological function.”



Michael Armellino, W’61

## Redefining Care for a Rare Disorder

After a long and successful career at Goldman Sachs, Michael Armellino, W’61, put his sights on using his wealth and experience to improve lives — and began a partnership that will redefine care, research, and the quality of life for those with the rare genetic disorder known as Williams syndrome.

“Most who are familiar with Williams syndrome describe it largely as a pediatric disorder,” Armellino says. “There are few places that offer care into adulthood, and the complexity of physical and psychological symptoms require coordination that is difficult to find at one institution. I wanted to help create a ‘front door’ for families affected by Williams syndrome — a center that could sustain itself while pushing the very leading edge of care and science.”

This was a need Daniel Rader, MD — the Seymour Gray Professor of Molecular Medicine, chair of Genetics, chief of the Division of Translational Medicine and Human Genetics in the Department of Medicine, chief of the Division of Human Genetics and Metabolic Disease Program at Children’s Hospital of Philadelphia — identified five years ago. Now those efforts, fueled by a physical campus that promotes collaboration and a long-standing clinic already at Children’s Hospital of Philadelphia, have found their greatest champion. Launched with a gift of \$25 million, the Armellino Center for Excellence

for Williams Syndrome aims to do nothing less than become the nation’s home for superlative care and support for patients and their families.

Williams syndrome affects one in every 7,500 people: hundreds of thousands of children and adults across the world who may experience intellectual disability, cardiovascular disease, and a variety of other medical conditions. Many of their psychological, developmental, and long-term care needs are not traditionally met as part of the reimbursable health care model.

Armellino’s gift means patients will have access to psychological and psychiatric support as they age through adolescence and into adulthood; physical and occupational therapy; social skills and job training; and assistance with government benefits, schooling and aftercare, and identifying long term support.

At the same time, the Armellino Center will complement the Williams Syndrome Association’s efforts to build a nationwide registry of patient information, as well as create a robust biobank to advance deeper research on Williams syndrome genetics. The Armellino Center is already at work recruiting a world-class expert to provide leadership over the Center’s comprehensive clinical and research programs.

“Mike Armellino has a deep understanding of the challenges facing Williams syndrome research and care, and we are grateful for this powerful vote of confidence in what Penn can achieve,” says Rader. “There’s a lot we can take from our other successful models in genetic and rare disease research, so when that’s coupled with a visionary approach to comprehensive care, the Armellino Center for Excellence for Williams Syndrome will radically change what is possible

Penn Medicine’s impact is driven by our talented clinicians, researchers, and faculty and fueled by the compassionate, visionary philanthropy of alumni and friends.

Visit <https://giving.upenn.edu/stories/> to be inspired by other examples of donor impact and learn more about making a gift at <https://www.pennmedicine.org/giving>.



**Joseph E. Bavaria, MD**, director of the Thoracic Aortic Surgery Program, has been presented with the Society of Thoracic Surgeons' (STS) 2022 Distinguished Service Award for his expertise in aortic disease, aortic dissections, and aortic valve repair and valve-sparing procedures.

**Paris Butler, MD**, an assistant professor of Plastic Surgery, and **Jenny Shao, MD**, an assistant professor of Clinical Surgery in Gastrointestinal Surgery, have been recognized as inaugural recipients of the American College of Surgeons (ACS) Innovative Grant for Diversity, Equity, Inclusion, and Anti-Racism. Butler has also been inducted into the Academy of Master Surgeon Educators™ by the ACS.

**Sara Cherry, PhD**, a professor of Pathology and Laboratory Medicine; **Katalin Karikó, PhD**, an adjunct professor of Neurosurgery and a senior vice president at BioNTech; **Mingyao Li, PhD**, a professor of Biostatistics; **Hongjun Song, PhD**, the Perelman Professor of Neuroscience, co-director of the IRM Neurodevelopment & Regeneration Program, and director of the Epigenetics Institute Neuroepigenetics Interest Group; and **E. John Wherry, PhD**, director of the Penn Institute for Immunology and chair of the Department of Systems Pharmacology and Translational Therapeutics, have been named to the 2021 class of American Association for the Advancement of Science Fellows.



**Sushant Kumar, PhD**, a postdoctoral scholar in Hematology and Oncology, has been recognized as one of nine emerging scientists for the 2022 Young Investigator Draft Class by

Uplifting Athletes for his research on rare bone marrow failure disorders.

**Kathryn Adamiak Davis, MD, MTR**, an assistant professor of Neurology and director of the Epilepsy Monitoring Unit, has been elected to the Board of Directors of the National Association of Epilepsy Centers (NAEC).



**Elle Lett, PhD**, a postdoctoral fellow and medical student, won the 2021 Rising Black Scientists Award for a post-graduate scholar by Cell Press and Cell Signaling Technology for her essay describing how to create a more inclusive scientific community.

**L. Scott Levin, MD, FACS**, the Paul B. Magnuson Professor and chair of Orthopaedic Surgery and professor in Plastic Surgery, has received the 2022 Kappa Delta Elizabeth Winston Lanier Award for establishing and evolving those fields' approach to the care of serious extremity injuries.

**Julio Chirinos, MD, PhD**, an associate professor of Medicine, **Rajan Jain, MD**, an assistant professor of Cardiovascular Medicine and Cell and Developmental Biology, **Mathew A. Kayser, MD, PhD**, an assistant professor of Psychiatry, and have been selected as new members of the American Society for Clinical Investigation, **Scott A. Lorch, MD**, a professor in Neonatology, **Raina Merchant, MD**, founding director of Penn Medicine's Center for Digital Health and a professor of Emergency Medicine.

**Scott Alan Peslak, MD, PhD**, a faculty instructor in Hematology-Oncology, has been selected as one of 36 recipients of the 2022

American Society of Hematology (ASH) Scholar Award and one of 12 to receive the Basic/Translational ASH Fellow Award, which provides funding of \$100,000 to support Peslak's research of red cell disorders, novel regulators of fetal hemoglobin, and new genetic and pharmacologic therapies for the treatment of sickle cell disease.

**Lynn M. Schuchter, MD, FASCO**, the C. Willard Robinson Professor and chief of the Division of Hematology-Oncology, has been elected as the American Society

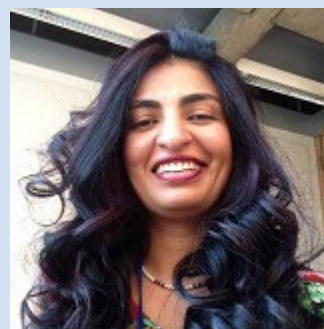


of Clinical Oncology's president for the 2023-24 term for her expertise in care and research for patients with melanoma.

**Peter Reese, MD**, a professor of Medicine and Epidemiology, and **Douglas E. Schaubel, PhD**, a professor of Biostatistics, received an \$8 million grant from the National Institutes of Health to provide a comprehensive view of the risks and benefits of transplanting kidneys infected with hepatitis C into uninfected patients. LINK:

**Joseph M. Serletti, MD, FACS**, chief of Plastic Surgery and the Henry Royster-William Maul Measey Professor in Plastic and Reconstructive Surgery, received the 2021 ASPS Honorary Citation Award from the American Society of Plastic Surgeons (ASPS).

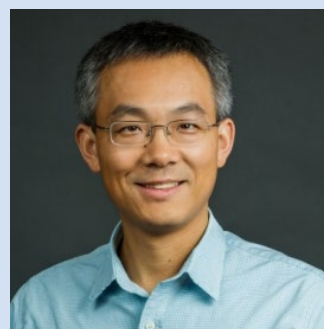
**Ragini Verma, PhD**, a professor of Radiology, has been elected to the American Institute for Medical and Biological Engineering's College of Fellows, which is comprised of the top two percent of medical and biological engi-



neers in the country, for her world-class research program in translational connectomics.

**Liling Wan, PhD**, an assistant professor of Cancer Biology, has been selected as one of 36 recipients of the 2022 American Society of Hematology (ASH) Scholar Award, and is one of 11 to receive the prestigious Junior Faculty Award.

**Wesley Wilson, PhD**, a postdoctoral researcher in Pathology and Laboratory Medicine.



**Peter Yang, PhD**, an associate professor of Biostatistics, and **Harold I. Feldman, MD**, the George S. Pepper Professor of Public Health and Preventive Medicine and director of the Center for Clinical Epidemiology and Biostatistics, were honored by the Clinical Research Forum for their paper "Race, Genetic Ancestry, and Estimating Kidney Function in Chronic Kidney Disease," named as one the Top 10 studies published in 2021.

Send your progress notes and photos to:  
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Philadelphia, PA 19104-3309  
medalum@dev.upenn.edu

## 1970s

**Bruce Tsang-Tang Liang, MD, GME'85**, has been named interim chief executive officer and executive president of Health Affairs at the University of Connecticut Health System. Liang will continue to serve as dean of UConn School of Medicine and the Ray Neag Distinguished Professor of Cardiovascular Biology and Medicine. Prior to UConn, Liang was an associate professor of Medicine and Pharmacology at the Perelman School of Medicine.

## 1990s

**Elizabeth A. Tarka, C'88, MD'92, GME'99**, has been appointed chief medical officer at XyloCor Therapeutics, a clinical stage biopharmaceutical company developing novel gene therapies for cardiovascular disease. Tarka is a cardiologist with more than 20 years of experience in the pharmaceutical and biotechnology industries.

**Ben H. Park, MD'95, GR'95, GME'01**, has been appointed director of the Vanderbilt-Ingram Cancer Center (VICC). Park is a Cornelius Abernathy Craig Professor of Medicine at Vanderbilt School of Medicine and has held multiple leadership roles within VICC, including deputy director, director of Hematology and Oncology, and director of Precision Oncology. Prior to working at Vanderbilt, Park was at the Sidney Kimmel Comprehensive Cancer Center at Johns Hopkins.

## 2000s

**Jan Boswinkel, MD'01**, senior vice president of Children's Hospital of Philadelphia (CHOP), has been named chief operating offi-

cer of the Middleman Family Pavilion, the new CHOP hospital in King of Prussia, Pa. Boswinkel envisions \$289 million, 52-bed facility, which opened in January 2022, as a community hospital and has been involved in the planning process since its inception.

**Mollie V. Leoni, C'99, MD'05, GR'05**, has been promoted to senior vice president of Clinical Development at Kura Oncology, Inc., a clinical stage biopharmaceutical company that specializes in cancer treatment developments. Leoni joined Kura as vice president of Clinical Development in February 2020 with extensive drug development experience focused on oncology and orphan diseases.

**Christian A. Dankers, MD'07, WG'07**, has been appointed associate chief medical and quality officer for The Chartis Group, a company that provides comprehensive advisory services and analytics to the healthcare industry. Dankers joins the leadership team of Chartis's Clinical Quality and High Reliability practice, which spans Chartis Consulting and the recently acquired Greeley Company.

**Anand J. Shah, MD'07, GME'10**, has been appointed operating advisor to Clayton, Dubilier & Rice, a private investment firm. Shah will work with CD&R's health care team to source new investments and advise the fund's health care businesses. Shah is a former deputy commissioner for Medical and Scientific Affairs at the US Food and Drug Administration.

## OBITUARIES

### 1940s

**Richard L. Cohen, BA'43, MD'47, GME'51**, a child and adolescent psychiatrist; Nov. 4. Cohen, formerly of Philadelphia and Pittsburgh, passed away in his home shortly after celebrating his 99th birthday. He served as a physician in the U.S. Air Force during the Korean War. After de-

veloping his psychiatric practice in Philadelphia, Cohen served as director of the Pittsburgh Child Guidance Center for several years. The rest of his medical career was spent at the University of Pittsburgh's Medical School and Western Psychiatric Institute where he was the director of the Program for Children and Adolescents. Cohen was an active member of the American Academy of Child and Adolescent Psychiatry and was its president in 1991 and 1992. During his "retirement," he was director of the Institute for Clinical Research Education (ICRE) at the University of Pittsburgh Medical School. He also authored *House Officer*, a study of how and why medical students ultimately select an area of practice, as well as multiple works of fiction.

**Edward J. Huth, MD'47, GME'51**, assistant professor of Medicine; Nov. 2. Huth completed his medical degree, internship, and residency in Internal Medicine at the Perelman School of Medicine. He joined the faculty as an assistant instructor in Pharmacology, eventually being promoted to assistant professor of Medicine. He also served as a staff physician in Penn's Department of Student Health. Huth was appointed editor-in-chief of *Annals of Internal Medicine* in 1971, raising it from a relatively obscure publication to a world-leading medical journal. He was widely known as the "dean of the American medical editors" for his many innovations in medical publishing. After retiring in 1990, he continued to write articles and books on medical editing and publishing for another 19 years, including his best-known, *How to Write and Publish Papers in the Medical Sciences*.

### 1950s

**Robert E. Botti, BA'50, MD'54, GME'58**, a cardiologist; Sep. 23. Botti completed his training at the Perelman School of Medicine. He then served in the U.S. Air Force as chief of the Medicine Division at Sheppard Air

Force Base in Texas. He was a professor of Medicine at Case Western Reserve University and director of Cardiology at University Hospitals in Cleveland, where he established the first coronary care unit. Botti served as director of Medicine at Hillcrest Hospital, director of the Meridia Heart Institute, and was a former president of the American Heart Association of Northeast Ohio.

**John R. Senior, MD'54, GME'59**, a hepatologist and gastroenterologist; Jan. 25. Senior completed an internship, residency, and clinical fellowship at the Perelman School of Medicine, followed by three years as a research fellow at Massachusetts General Hospital and Harvard University. He then joined the faculty at PSOM as a clinical professor of Medicine in 1962. He served in a variety of roles over his 65-year career, including senior attending physician and director of the Gastrointestinal Research Laboratory and Clinical Research Center at Philadelphia General Hospital, vice president for Clinical Affairs at the Squibb and Sterling-Winthrop Research Institute, and a consultant to pharmaceutical companies around the world. He was the associate director of Science at the U.S. Food and Drug Administration and was president of the American Association for the Study of Liver Diseases and received its Distinguished Service Award.

**John R. Pellett, MD'54, GME'61**, a surgeon; Sep. 25. Pellett served in the U.S. Navy and completed his training at the Royal College of Surgeons in London. He taught and practiced general, thoracic, and pediatric surgery at the University of Wisconsin Hospital, where he eventually became professor emeritus. Notably, Pellett performed the university's first separation of conjoined twins, first lung transplant, first double lung transplant, and first heart-lung transplant. He was a member of the American College of Surgeons, the Society of Thoracic Surgeons, the Wisconsin Surgical



Society, the Wisconsin Surgical Club, and the General Thoracic Surgical Club.

**Horace MacVaugh III, MD'55, GME'62**, a cardiothoracic surgeon; Jan. 24. MacVaugh completed a residency at the Perelman School of Medicine. He then joined the Naval Reserve medical corps, serving as a flight surgeon and eventually retiring as a two-star rear admiral. He joined the faculty at PSOM as a professor of Surgery, and later moved to Jefferson Medical College. A pioneering heart surgeon in great demand, he performed one of the first coronary artery bypass surgeries at the Hospital of the University of Pennsylvania. He later worked at Lankenau Hospital and Graduate Hospital.

**Richard S. Howard, MD'57**, a urologic surgeon; Sep. 28. Howard completed an internship at the Reading Pennsylvania Hospital and served as a captain and flight surgeon in the U.S. Air Force, stationed at the USAF Academy in Colorado Springs, CO. He completed his residency in Urology at the University of Virginia–Charlottesville, earning an MS in Surgery-Urology. He practiced in the Urology department at Gundersen Clinic–Lutheran Hospital (now Gundersen Health Systems) in La Crosse, WI, until his retirement.

**William O. Reid, MD'57, GME'61**, a pathologist; Oct. 18. Reid had a distinguished career in the field of pathology and published breakthrough research in the treatment of hemophilia.

**Harry M. Woske, MD, GME'57**, a cardiologist; Jan. 5. Woske earned his medical degree from the University of New York Downstate, interned at Kings County Hospital in Brooklyn, NY, and completed a residency and fellowship at the Perelman School of Medicine. He served on active duty in the U.S. Army Medical Corps during the Korean War. Woske was the founder and head of Hunterdon

Cardiovascular Associates at Hunterdon Medical Center in Flemington, NJ. He was active in the Flemington community, serving as a trustee of Hunterdon Healthcare and of the Hunterdon Healthcare Foundation. Woske was also a member of the Ethics Institutional Review Board for New Jersey and a member of the Hunterdon County Medical Society.

**Van Millett Robinson, MD'58, GME'62**, an obstetrician and gynecologist; Jan. 17. Robinson was president of his medical school class, and remained at Penn for his internship and residency in Obstetrics and Gynecology. He worked for two years in private practice in Modesto, CA, before founding Robinson, Slaughter and Triplett (now Northland Obstetrics and Gynecology) in North Kansas City, MO. Robinson served in many leadership roles at North Kansas Hospital, including chief of Surgery, chief of Obstetrics and Gynecology, and member of the board of trustees and executive committee. After retiring, he returned to medicine, practicing at the Odell Ave. Medical Clinic in Marshall, MO, and then serving as a locum tenens physician on several Native American reservations and at the Naval Station Newport in Rhode Island.

## 1960s

**Carlos G. Benavides Jr., MD'60**, an otolaryngologist; Dec. 25. Benavides served three years in the U.S. Navy as a lieutenant and physician. He completed his training with residencies at Lenox Hill Hospital and the New York Eye and Ear Infirmary, both in New York City, then practiced as an ear, nose, and throat specialist in Manchester, CT, for more than 40 years.

**Theodore E. Braun Jr., MD'60, GME'63**, an obstetrician and gynecologist; Oct. 23. Braun completed a residency from the Perelman School of Medicine. He then served as a physician and captain in the U.S. Air Force. Following three years in private practice in suburban Philadel-

phia, he joined the faculty at the University of Vermont College of Medicine, where he worked for 27 years and became an emeritus associate professor. He served as medical director and a member of the Board of Directors of Planned Parenthood of Vermont, was elected president of the Medical Staff at the Medical Center Hospital of Vermont, and was named a member of Best Doctors in America in 1996. He was named a "Kentucky Colonel," the highest civilian honor bestowed by the Governor of Kentucky, the state of his birth.

**Horry H. Kerrison, GME'61**, an ophthalmologist; Jan. 7. Kerrison earned his medical degree from the Medical College of South Carolina (MUSC) and completed an Ophthalmology residency at the Perelman School of Medicine. He returned to Charleston, SC, and developed and maintained a private ophthalmology practice there until his retirement in 2009. Kerrison was also a clinical assistant professor at MUSC, and served in the U.S. Navy as a physician, attaining the rank of commander. In his honor, the Charleston ophthalmic community funded the Kerrison Endowed Lecture, which annually attracts world-renowned ophthalmologists to lecture at MUSC's Storm Eye Institute.

**Alan M. Laties, MD, GME'61**, emeritus professor of Ophthalmology; Dec. 26. Laties earned his medical degree from Baylor College of Medicine, interned at Mt. Sinai Hospital in New York City, and completed his residency in Ophthalmology at the Perelman School of Medicine. He served as a postdoctoral fellow in the Institute of Neurological Science before joining the faculty at PSOM in 1960 in Ophthalmology. In the early 1980s, Laties was named chair of Research at the Scheie Eye Institute, and in 1984, he was named the Harold G. Scheie Research Professorship in Ophthalmology. Eight years later, he was named the Harold G. Scheie/Nina C. Mackall Research Professor in Ophthalmology. In addition to Penn's prestigious Lindback Award for Distinguished Teach-

ing, Laties received numerous honors, including the Jonas Friedenwald Award, the National Retinitis Pigmentosa Foundation Humanitarian Award, and the Paul Kayser International Award of Merit in Retina Research from the International Congress of Eye Research.

**John J. Downes, MD, GME'63**, emeritus professor of Anesthesiology and Critical Care; Dec. 17. Downes earned his medical degree from the Loyola University School of Medicine and interned at Indianapolis General Hospital. He worked for two years with the Indian Health Service in South Dakota and in Tacoma, WA. He came to the Perelman School of Medicine for a residency in Anesthesiology, funded by a National Institutes of Health fellowship in Pharmacology. Downes was recruited to the Children's Hospital of Philadelphia as an assistant professor of Anesthesiology, where he inaugurated the hospital's pediatric intensive care unit, the first of its kind in North America, earning national acclaim. He was promoted to associate professor of Anesthesiology and later to full professor, and eventually became anesthesiologist-in-chief and director of Anesthesiology and Critical Care Medicine, a position he held for more than 20 years. Downes developed a multidisciplinary approach to caring for seriously ill hospitalized children and inspired and trained multiple generations of pediatric anesthesiologists and intensivists, setting a standard of care and professionalism. He was an advocate for better healthcare for children, and the Commonwealth of Pennsylvania launched a pioneering home care program for disabled children in the 1970s thanks in large part to his efforts. Downes was also the medical director of the Pennsylvania Ventilator-Assisted Children's Home Program initiative for more than 25 years. Among his many accolades is a 1995 award from Penn Medicine for distinguished teaching.

**Richard Merrill Schieken, MD'65, GME'69**, a pediatric cardiologist; Nov. 13. He completed a residency and fellowship at the Children's Hospital of Philadelphia. He was a pediatric cardiologist at the University of Iowa and the Medical College of Virginia.

**Seymour Shlomchik, BA'55, MD, GME'65**, an orthopedic surgeon; Nov. 23. Shlomchik earned his medical degree from Jefferson Medical College and completed a surgical residency at the Perelman School of Medicine. He served in the U.S. Navy during the Vietnam War, performing reconstructive surgery at the Philadelphia Naval Hospital. He was a solo orthopedic surgery practitioner in northeast Philadelphia for more than 30 years.

**John W. Crispen, MD'66**, a pathologist; Oct. 27. Crispen served in the U.S. Army, attaining the rank of major. He spent most of his career practicing pathology at Gettysburg Hospital and Chambersburg Hospital in Pennsylvania until his retirement in 2005.

**Richard R. Nugent, MD'66**, an obstetrician and gynecologist; Jan. 30. Nugent completed his training in Obstetrics and Gynecology in Burlington, VA, and received a master's degree in Public Health at the University of North Carolina. He served as the medical director of the North Carolina State-Wide Perinatal Program and assistant chief of the Women's Health section, then became director of Maternal and Child Health for the Bureau of Public Health Programs for the Arkansas Department of Health. He also served as professor of Health Policy and Management at the University of Arkansas for Medical Sciences (UAMS), where he oversaw the development of the Maternal and Child Health branch of the UAMS Master of Public Health. His many honors include the Ross Award for Distinguished Service in Maternal and Child Healthcare from the Southern Health Association for Outstanding Service and Contributions to Public Health, the Hawks-Workman Award from the UAMS High-

Risk Pregnancy Program, and the Maternal and Child Health Bureau Director's Award from the U.S. Department of Health Resources and Services.

**John Scott Parks, MD'66, GME'67, PhD'71**, a pediatric endocrinologist; Dec. 23. Parks received his PhD in biochemistry at the University of Pennsylvania and his pediatric endocrine training at Children's Hospital of Philadelphia (CHOP). He was also a clinical associate in the Endocrinology Branch at the National Cancer Institute and served in the Reserve Corps of the U.S. Public Health Service. Upon completion of his training, Parks joined the faculty in Pediatrics and Genetics at the Perelman School of Medicine, working at CHOP. He later founded the division of Pediatric Endocrinology at Emory University in Atlanta, where he served as division chief for 25 years and retired as professor emeritus with tenure. Parks served on numerous committees and boards, including the National Hormone and Pituitary Program at the National Institutes of Health, and the Pediatric Endocrine subcommittee of the American Board of Pediatrics.

## 1970s

**Burton V. Silverstein, MD'70**, a cardiologist; Nov. 4. Silverstein served in the medical corps of the U.S. Air Force in Guam during the Vietnam War before returning to the Perelman School of Medicine to finish his residency in Internal Medicine. He completed a Cardiology fellowship at Duke University, becoming a board-certified cardiologist. Silverstein practiced in Gainesville, N.C., first with Cardiology Associates of Gainesville and then with the Cardiovascular Institute, until his retirement in 2021.

**Robert Allen Doughty, MD'73, PhD'73, GME'73**, a pediatric rheumatologist; Jan. 21. Doughty earned his PhD in immunology from the University of Pennsylvania. He served at Children's Hospital of Philadelphia as direc-



tor of the Pediatric Residency Program and chair of Pediatrics. Doughty later became medical director at Alfred I. DuPont Hospital for Children (now Nemours Children's Hospital) and established a partnership with Thomas Jefferson University to develop a pediatric residency department there. He was appointed vice president for Nemours Physician Practices at the Nemours Foundation in Jacksonville, FL. Doughty held faculty appointments at PSOM and Jefferson at times throughout his career. He also served as Senior Scholar for Leadership Development and Experiential Education at the Accreditation Council for Graduate Medical Education.

**Andrew G. Weinstein, MD'73, GME'77**, a pediatrician and allergist; Oct. 3. Weinstein completed a residency in Pediatrics and a fellowship in Pediatric Allergy at Children's Hospital. He later became the chief pediatric resident at Hahnemann Hospital and spent two years training in family therapy at Philadelphia Child Guidance. His professional certifications included the American Board of Pediatrics, the American Board of Allergy and Clinical Immunology, and as a trainer in Motivational Interviewing. Weinstein spent 35 years as a practicing allergist with Asthma & Allergy Care. He was the president of the Pennsylvania Allergy Association and a member of the American Academy of Allergy, Asthma, and Immunology; the American College of Allergy, Asthma, and Immunology; the Medical Society of Delaware; and the Delaware Asthma and Allergy Society.

**Kenneth A. Kessler, BA'65, MD, GME'73**, a psychiatrist; Sep. 27. Kessler earned his medical de-

gree from Temple University School of Medicine, completed a psychiatric internship at Washington Hospital Center, followed by a residency at the Perelman School of Medicine. His first company, a managed mental healthcare company called American Psych Management, was one of the first in the field. A pioneer in managed mental health care, Kessler went on to start several successful businesses in disease and addiction management.

**John W. Severinghaus, MD, GME'73**, an anesthesiologist; Jun. 2. Severinghaus earned his medical degree from Columbia University. He conducted field clinics as a medical missionary in remote Navajo settlements, then worked at the National Institutes of Health. There, he invented the first electrode to measure carbon dioxide in the blood, followed by the first blood gas analyzer, now a tool routinely used in acute care hospitals. In 1958, Severinghaus joined the anesthesia department at the University of California San Francisco, where he researched the effects of high altitude on blood gases, as well as pulse oximetry, which later contributed to the accurate measurement of oxygen saturation levels in COVID-19 patients. A lecture series was created in his name by the American Society of Anesthesiologists. Severinghaus received honorary doctorates from the Universities of Copenhagen and Uppsala, and an honorary fellowship from the Royal College of Anaesthetists.



**Amy C. Brodkey, MD'75**, clinical associate professor of Psychiatry; Nov. 22. She served as a family physician at the Elizabeth Blackwell Health Center for



Women in Philadelphia. Brodkey joined the Medical College of Pennsylvania (now the Drexel University College of Medicine), where she served as director of Medical Student Education and as a faculty member in Psychiatry. She then returned to the Perelman School of Medicine as a clinical associate professor of Psychiatry, where she helped write original psychiatric curriculum for medical school graduates. She retired in 2014 as the medical director of Behavioral Health at the Family Practice and Counseling Network, a group of centers that provide primary care and mental health services for residents of Philadelphia housing projects.

**Robert L. Giuntoli Sr., MD, GME'75**, associate professor emeritus of Obstetrics and Gynecology; Sep. 21. Giuntoli attended Saint Louis University School of Medicine in 1965 on an ROTC scholarship, fulfilled his internship and residency training with the military, and then served in the U.S. Navy during the Vietnam War. After transitioning from active duty to the Navy Reserve, he was accepted as the first board-accredited gynecologic oncology fellow at the Hospital of the University of Pennsylvania. Giuntoli joined the faculty at Penn's School of Medicine in 1975, becoming associate professor of obstetrics and gynecology in 1982; he retired in 1992. He was an expert in the management of cervical dysplasia, co-writing in 1987 an atlas on the diagnosis of cervical dysplasia and cervical cancer, *Atkinson's Correlative Atlas of Colposcopy, Cytology, and Histopathology*. He published numerous peer-reviewed articles in academic journals, including the *Journal of the American Medical Association*, and was a member of the St. George Medical Society, a component of the American Cancer Society's Philadelphia Division's Professional Education Program.

## John Q. Trojanowski, a Leader in Neurodegenerative Disease Research



John Q. Trojanowski, right, is survived by his partner in life and research, Virginia M-Y Lee, PhD, MBA.

The Penn community mourns the passing of **John Q. Trojanowski, MD, PhD, GME'80**, on Feb. 8, 2022.

Trojanowski earned his MD and PhD in Neuroanatomy in 1976 from Tufts University before completing residencies in Pathology and Neuropathology at Harvard Medical School and the Perelman School of Medicine. He joined the Perelman School of Medicine faculty in 1980. Trojanowski was named the William Maul Measey – Truman G. Schnabel, Jr., MD Professor of Geriatric Medicine and Gerontology in 2002 when he became director of the Institute on Aging (IOA), which under his direction became a model for interdisciplinary collaboration. He remained at Penn for his entire career, helping to establish numerous programs including the Marian S. Ware Alzheimer Program, the Penn Alzheimer's Disease Center, the Morris K. Udall Center of Excellence for Parkinson's Disease Research, and the NIA Penn U19 Center of Alpha-Synuclein Strains in Alzheimer Disease and Related Dementias.

A pioneer in aging and aging-related disease research, Trojanowski, along with his scientific partner and wife, Virginia M-Y Lee, PhD, directed the Penn Center for Neurodegenerative Disease Research, which had international impact as a catalyst for research in the field. With a novel understanding of the complexity and breadth of the pathologies that underlie Alzheimer's and related diseases, together they identified the brain protein key for numerous neurodegenerative diseases and helped create the modern field of neuropathology. Three of their discoveries stand

out as historic, field-defining accomplishments: the demonstration of tau as the major constituent of neurofibrillary tangles in Alzheimer's disease; the discovery that Lewy bodies are comprised of alpha-synuclein; and the discovery that inclusions in frontotemporal lobar degeneration (FTLD) and amyotrophic lateral sclerosis (ALS, or Lou Gehrig's disease) are made of TDP-43 protein. Trojanowski contributed to an astonishing 1,400 publications in total and is one of the most cited neuroscientists in the world.

Among many other national leadership positions, Trojanowski served as president of the American Association of Neuropathology. He was also active at the National Institute on Aging, becoming the director of the Alzheimer's Disease Center Core and serving on the Board of Scientific Counselors, the National Advisory Council on Aging, and the Neuroscience, Behavior and Sociology of Aging Review Committee. Trojanowski led the Biomarker Core of the Alzheimer's Disease Neuroimaging Initiative, a longitudinal study that has changed how patients are diagnosed. His many honors include election to the National Academy of Medicine, the Alzheimer's Association Lifetime Achievement Award, and the Potamkin Prize for research into Alzheimer's disease and related disorders.

Leading up to the end of his life, Trojanowski continued writing manuscripts and grants while overseeing tens of millions of research dollars, maintaining a tireless pursuit to raise awareness for aging and to better understand age-related diseases.

## 1980s

**Yu-Chin Liu, MD'84**, an internist; Nov. 1. Liu completed his residency in Internal Medicine at the UCLA-San Fernando Valley Program and became board certified. He had a solo practice in Torrance, CA, and was an active member of the Asian American Physician Association, serving as the chair of the Medical Education and Scholarship Committees. He later moved to Washington, where he practiced at Evergreen Hospital in Kirkland and then opened a solo practice in Bellevue. He also worked in Hawaii and in Shanghai, China before his retirement.

## FACULTY

**Amy C. Brodkey, MD.** See Class of 1975.

**John J. Downes, MD.** See Class of 1963.

**Mary Bagan Dratman, CW'40**, adjunct professor of Medicine and Psychiatry; Jan. 17. Dratman earned her medical degree from the Woman's Medical College of Pennsylvania and became its founding director of Endocrinology in Medicine. She served as chief of Endocrinology at the Medical College of Pennsylvania, where she later became a professor in Medicine. In 1981, Dratman joined the faculty of the Perelman School of Medicine as an adjunct professor in Medicine and Psychiatry. She also worked for the Veterans Administration Medical Center and taught at Rockefeller University. She received many awards, including the 2013 Women in Medicine Award from the Drexel University College of Medicine.

**Robert L. Giuntoli Sr., MD.** See Class of 1975.

**Edward J. Huth, MD.** See Class of 1947.

**Haig H. Kazazian Jr., MD**, emeritus professor of Genetics; Jan. 20. After completing a two-year preclinical program and working in several laboratories at

Dartmouth College, Kazazian transferred to Johns Hopkins University School of Medicine and earned his degree there in 1962. He completed pediatrics training at the University of Minnesota Hospital and at Johns Hopkins. From 1966 to 1969, Kazazian conducted research on hemoglobin regulation at the



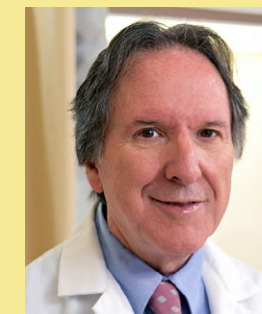
National Institutes of Health, then returned to Johns Hopkins, where he continued this research and helped develop methods for prenatal diagnosis of sickle cell anemia and other hemoglobin disorders. Kazazian was recruited to the Perelman School of Medicine in 1994 as the Seymour Gray Professor of Molecular Medicine in Genetics, which he helped to build. In 2011, Kazazian retired from Penn, taking emeritus status, and returned to Johns Hopkins as a professor of Pediatrics, Molecular Biology, and Genetics. He resumed his research on LINE-1 retrotransposons—insertions into the DNA that cause disease. Kazazian's accolades include the Mead Johnson Award for Pediatric Research from the National Hemophilia Foundation, the Allan Award from the American Society of Human Genetics, election to the National Academy of Sciences, and a Fellowship with the American Academy of Arts and Sciences.

**Alan M. Laties, MD.** See Class of 1961.

**Horace MacVaugh III, MD.** See Class of 1955.

**John R. Senior, MD.** See Class of 1954.

## Blazing a 'Winding Path' to Medicine



For Kenneth Patrick, MD'78, the path to the Perelman School of Medicine was winding. Although he had chosen to study engineering as an undergraduate, a co-op job in his college's biomedical engineering department drew him into making an impact through medicine instead.

A mentor from that experience was the late Dr. Maria Delivoria-Papadopoulos, professor and founding director of Newborn Services at the Hospital of the University of Pennsylvania (HUP). In the 1970s, she was breaking new ground with work at the intersection of medicine and engineering. It was Delivoria-Papadopoulos who recognized Patrick's potential and recommended him to PSOM; and she was one of the attending physicians when he completed his elective in neonatology years later.

A hospitalist and loyal PSOM alumnus, Patrick has also been a consecutive supporter since 2013 and served as a HOST volunteer, supporting students with local resources when they travel for residency interviews.

Patrick feels PSOM's willingness to admit a student without a life-science background, like him, was indicative of one of its greatest strengths: a student body comprised of students of varied perspectives. Today, PSOM and Penn's School of Engineering and Applied Sciences (SEAS) interact in innumerable ways and opportunities for non-traditional students have become even more valued. In 2021's entering class, 67 percent of students came from non-traditional backgrounds.

Patrick recently established an endowed scholarship fund with preference for students with a background in engineering "If I can support even one single person at the Perelman School of Medicine on their path to becoming a physician — and they then go on to change a patient's life, whether through treatment or even compassion and support — I will have done my job."

Patrick is helping the next generation of physicians with Qualified Charitable Distributions (QCD) through his retirement account. Through a QCD, when Patrick turns 70.5 years old, he can make gifts during his lifetime and augment the existing fund with a deferred gift through a retirement with both outright and deferred gifts, Patrick can see his philanthropy in action now and know his scholarship will be well-funded into the future.

Patrick explains, "With this scholarship, my dream is that a Perelman School of Medicine student can one day say, 'I am a great physician because someone chose to invest in my education.'"

► For more information, please visit our website at: [www.pennmedicine.org/plannedgiving](http://www.pennmedicine.org/plannedgiving).

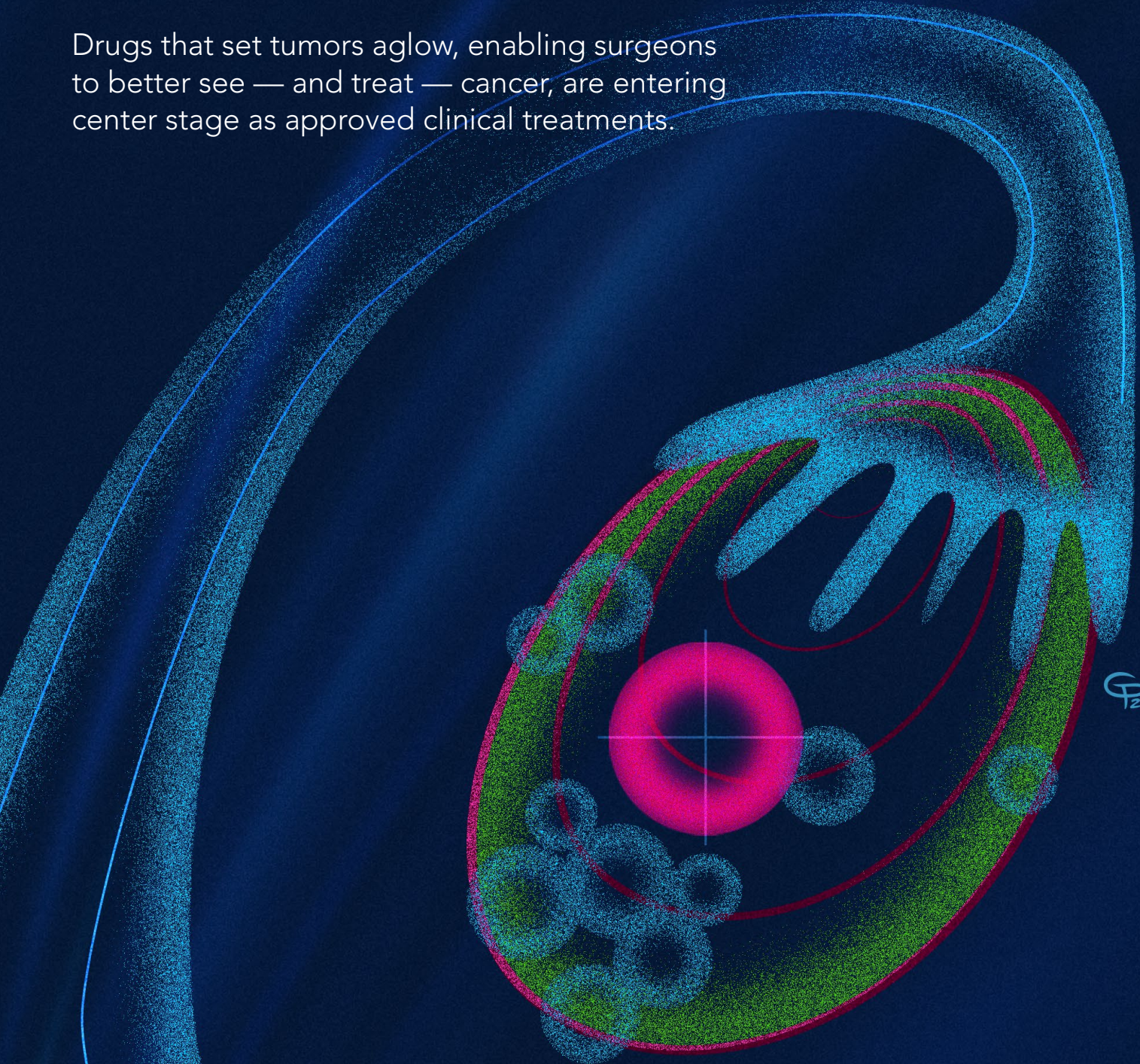
Planned giving is often described as the final piece of a philanthropic puzzle. Figuring out how this important piece can work best for you, your family, and your philanthropic goals is what we do best. If you are a donor who wants to give through a retirement plan (IRA, 401(k), 403(b), etc.) or through the Charitable IRA Rollover, please contact Christine S. Ewan, JD, senior executive director of development, at 215-898-9486 or at [cewan@upenn.edu](mailto:cewan@upenn.edu).



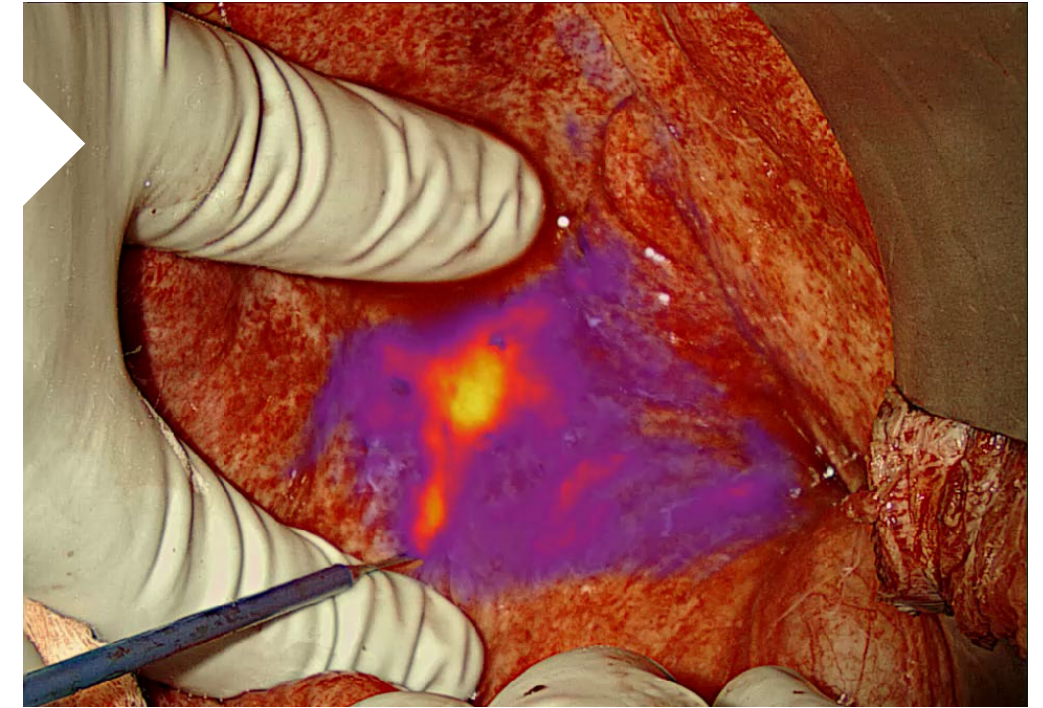
# IN THE SPOTLIGHT

By Meredith Mann

Drugs that set tumors aglow, enabling surgeons to better see — and treat — cancer, are entering center stage as approved clinical treatments.



Lighting up cancer cells with an imaging agent makes it easier to surgically remove all of the malignant tissue.



The patient, a woman with ovarian cancer, is on the operating table, while a surgeon attempts to locate and remove all of the diseased tissue.

Then, with the flick of a switch, fluorescent light shines into the surgical site. Before the operating team's eyes, the tumors — some of which aren't otherwise visible, or easily palpable even to expert fingers — pop into view, glowing a bright purple to the naked eye.

After years of scientific searching for a way to make malignant cells easier to find, for the first time, this type of “glowing tumor” technology was approved by the U.S. Food and Drug Administration (FDA) in November 2021.

The FDA approval of the imaging agent, a drug called Cytalux (pafolacianine), is for use in ovarian cancer treatment. Patients with confirmed or suspected cancer receive Cytalux by IV before surgery. The glow it brings to tumor cells allows surgeons to target those areas for removal, and to leave healthy tissue alone.

One of the largest U.S. clinical trial sites for the agent is the Center for Precision Surgery in the Abramson Cancer Center at the University of Pennsylvania, in a partnership with On Target Laboratories of Indiana.

“Lighting up cancer, which helps to identify lesions that may be difficult to find — especially in the presence of scar tissue or other organ damage — enables more complete identification and surgical removal of cancer that could

have otherwise been missed,” according to Janos L. Tanyi, MD, PhD, an associate professor of Obstetrics and Gynecology in Penn's Perelman School of Medicine and principal investigator at Penn's clinical trial site for Phase 2 and Phase 3 studies of Cytalux.

Penn investigators and other industry partners have pioneered additional targeted imaging technologies for lung, brain, breast, sarcoma, head and neck, and urinary tract cancers.

“This approach is an important step toward greater precision during surgery for ovarian cancer,” says Sunil Singhal, MD, director of the Center for Precision Surgery and the William Maul Measey Professor in Surgical Research. “Our studies for other indications continue, in an array of different cancers.”

Which means that science is beginning to see the light on how to better treat cancer. □

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## SERVICE IN ACTION

In Kensington, the Philadelphia neighborhood hardest-hit by the opioid epidemic, a Penn Medicine team realized they had the opportunity to provide free COVID testing — and so they have, every week, for nearly two years. “I truly believe interfacing with health care clinicians in that kind of harm reduction framework can start rebuilding the damaged, distrustful relationship between health care and people who use drugs,” says Rachel McFadden, BSN (pictured below at right). “That’s kind of a big thing.”

▶ Read the story inside this issue on page 24 and find more Service in Action stories online at <http://CommunityImpact.PennMedicine.org>.

