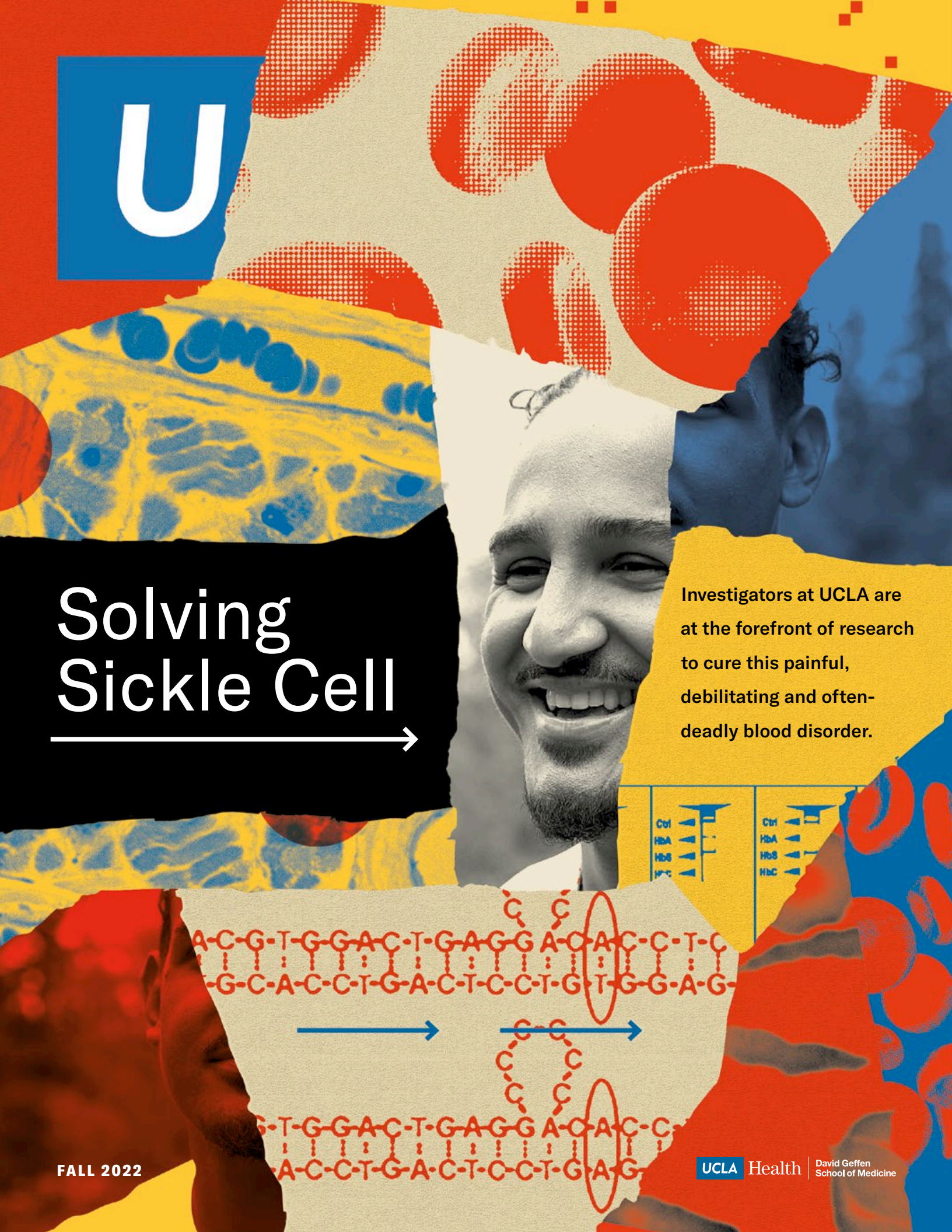
Solving Sickle Cell

Investigators at UCLA are at the forefront of research to cure this painful, debilitating and often-deadly blood disorder.



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BREAKTHROUGHS AND NEWS FROM UCLA HEALTH.

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> "Our unhoused neighbors are still our neighbors. They need to be treated with dignity and respect. In some ways, I wish our program didn't have to exist. I feel that health care is a human right, and we should be able to deliver efficient, effective, equitable care to everybody. But this is the reality in which we live."
>
> *— Brian P. Zunner-Keating, RN, "House Calls Without Walls," p. 40*

Patients, or the families of patients, quoted and/or photographed or pictured in this publication have given their consent to have their names and/or images used and their stories told.

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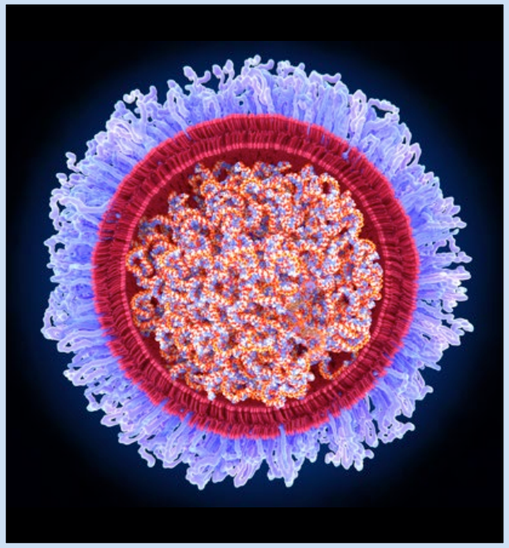
Science Wins

In the race to cure sickle cell disease, the same spirit that brought us COVID-19 vaccines will power us across the finish line.



JUAN GAERTNER/SCIENCE SOURCE

mRNA embedded in a lipid nanoparticle (red) with a polyethylene glycol coat (violet). The mRNA encodes a modified version of the viral spike protein.

SICKLE CELL DISEASE IS THE MOST COMMON INHERITED BLOOD DISEASE in the United States, afflicting an estimated 100,000 people. The disease causes a litany of miseries: excruciating pain crises, organ damage, bone loss, stroke, blindness, lung disorders, anemia. It both shortens and circumscribes patients' lives, undermining their ability to pursue an education, earn a living or raise children. Yet, as you will read in the cover story of this issue of *U* Magazine ("Solving Sickle Cell," p.30), scientists are closing in on a cure for this genetic plague, with UCLA Health researchers in the vanguard of that effort.

The race isn't won yet. But for anyone who doubts it soon will be, I'd recommend considering a recent victory that science scored against seemingly impossible odds: the advent of the first two vaccines against COVID-19, both based on a novel technology, within months of the pandemic's arrival. The key to that double breakthrough — achieved in a fraction of the time it took to create any previous vaccine — was a decades-long research process that preceded the public health emergency.

The molecule that made the Moderna and Pfizer-BioNTech vaccines possible is known as mRNA. In nature, its function is to carry instructions from a cell's genes to its protein-manufacturing machinery. Scientists first isolated mRNA in 1961. A few years later, they learned to transport it into mouse and human cells, using fatty-membrane structures called liposomes. They weren't trying to develop vaccines; they just wanted to better understand how the protein-making process worked. The hope was that someday, such basic research could produce something useful.

In the 1980s, investigators developed the procedures to synthesize biologically active mRNA in the lab. At that point, they began exploring ways to develop mRNA as a therapeutic agent. It wasn't until the '90s, however, that they realized that an mRNA encased in a liposome could be used to create a vaccine. Then came another 20-odd years of tinkering, as scientists designed mRNA vaccines for one disease after another — influenza, HIV, cancer — and tested them in cell cultures and animal models. These ventures failed repeatedly, but they taught scientists more each time.

By the mid-2010s, two clinical trials were underway with mRNA vaccines — one for rabies, the other for flu. A few biotech companies had entered the field, and the U.S. Defense Advanced Research Projects Agency (DARPA) was funding industry research. Then, in January 2020, the World Health Organization announced an outbreak of coronavirus-related pneumonia in Wuhan, China. Within days, the SARS-CoV-2 virus's genome had been posted online and Moderna had begun creating a prototype vaccine to fight it.

By March, when the WHO declared the pandemic, BioNTech and Pfizer had teamed up for their own assault. Government money began flooding to these and other companies and academic centers, accelerating data acquisition and exchange. Human trials got underway. Both mRNA vaccines soon proved to be 95% effective. And in December 2020, the Food and Drug Administration granted each of them emergency-use approval.

Science had won.

The race to cure sickle cell disease has followed a similar pattern: a marathon of basic research and clinical trials involving a variety of ailments, followed by a sprint in the final stretch. Because society responds less urgently to chronic disorders than to viral pandemics, it will take a bit longer to reach the finish line. But we'll get there, nonetheless.

In the case of sickle cell, the technology that offers this promise is gene therapy — a procedure in which a patient's aberrant cells are genetically reprogrammed. Human trials for this approach began in 1990, showing promising results in children with severe immunodeficiencies. Over the next 20 years, scientists developed experimental gene therapies for a range of inherited diseases, as well as for various cancers and HIV. Some of these were eventually approved by the FDA.

For sickle cell disease, however, the first clinical trial of gene therapy had to wait until 2013, when scientists had refined the technique — and their understanding of this complex disease — enough to ensure that it had a chance of working. Since then, dozens of patients who have received such therapies — including some at UCLA — have found lasting relief after a single treatment. More time and study are needed to monitor for long-term efficacy and potential delayed side effects, but there's ample reason for optimism.

Such successes help explain why scientists are willing to spend decades pursuing research that has no immediate application and conducting trials that don't pan out. In part, it's sheer curiosity — a yen for knowledge. But it's also a desire to make a difference. Scientists watch their friends, family members, neighbors or loved ones suffer. If they're clinicians, they witness their patients struggle. They want to help. And that deeply human impulse keeps them at the lab bench or the study site, day after day, year after year.

"It is sometimes said that science has nothing to do with morality," the biochemist Linus Pauling once observed. "This is wrong. Science is the search for truth, the effort to understand the world; it involves the rejection of bias, of dogma, of revelation, but not the rejection of morality."

I'd go a step further: Science, at its best, is *driven* by morality. It aims not only to find the truth, but also to harness it for the betterment of the human condition.

That's why, sooner or later, science always wins.

John C. Mazziotta, MD (RES '81, FEL '83), PhD
Vice Chancellor, UCLA Health Sciences
CEO, UCLA Health

RELIEF FOR UKRAINE

By Jocelyn Apodaca Schlossberg

AP PHOTO/ALEX CHAN

Russian missiles and artillery have struck the southern Ukrainian city of Mykolaiv, badly damaging or destroying a number of public buildings, including what Ukrainian officials say was a cancer hospital (not pictured).

THE RUSSIAN INVASION OF UKRAINE has displaced more than 12 million people, among them nearly 180,000 newly diagnosed cancer patients in need of treatment and medication. As they have in past international crises, people at UCLA Health stepped up to help.

Since June, two shipments of cancer drugs and supplies gathered by faculty, staff and students of UCLA Health have been shipped to Ukraine for patients desperately in need. The first shipment, coordinated by John A. Glaspy, MD '79 (RES '82, FEL '83), Simms/Mann Family Foundation Chair in Integrative Oncology and professor of medicine at the UCLA Jonsson Comprehensive Cancer Center, and Project HOPE, a global health and humanitarian aid organization, arrived in Kharkov, Ukraine, on June 8.

"Typically, in a situation like this, people might buy [cancer] drugs and donate them, but that isn't efficient or sustainable," Dr. Glaspy says. Instead, he went straight to the source — the manufacturers — where he spoke with biopharmaceutical CEOs about sending donations to Ukraine.

Both companies, Amgen and McKesson, agreed to the arrangement.

"THE DELIVERY WAS COMPLEX, involving import and export regulations and customs in three nations — the United States, Poland and Ukraine," says Jason Obten, Project HOPE global logistics director. "It required precision timing to ensure that the cold-chain requirements were maintained throughout the shipping process up to the point of delivery in Kharkov."

The shipment included 3,000 vials of filgrastim, a drug to help the body make white blood cells after chemotherapy treatment. The donation to the Grigoryev Institute of Medical Radiology and Oncology of The National Academy of Medical Sciences of Ukraine has thus far helped treat more than 50 patients.

"We cannot thank Dr. Glaspy and UCLA Health enough for the tremendous effort to make this donation possible," Obten says.

A second shipment followed in July, 25 pallets of medical supplies, ranging from surgical masks and face shields to sponges and bandages — more than 13,000 pounds — to the International Medical Corps of Ukraine in Kyiv.

"We had leftover medical supplies from Care Harbor [an annual clinic to provide medical care to underserved populations in Los Angeles], and donating to Ukraine was the best way for us to utilize them," says Candis Crockett, principal analyst at UCLA Health, who helped manage the donation logistics. "It's been a difficult time with the global supply chain, so it made sense that sending supplies, rather than money, would have a greater impact."

Students from Medical Aid Initiative, a student-run organization partnering with UCLA Health to share resources globally, also participated in the effort, donating supplies and time in the warehouse.

"Every time there has been an international crisis, we have turned to the MAI students to help support our humanitarian efforts, and their contribution as they gather and prepare shipments of available medical supplies has been invaluable," says Fedra Djourabchi, director of strategic marketing at UCLA Health.

One of the greatest aspects of this donation was that people from all areas of the organization joined in, according to Crockett. "From clinical engineers helping with CO_2 monitors to the patient-transport team, who shuttled students and volunteers from campus to the warehouse to help assemble the pallets, everyone pitched in."

CANDICE CROCKETT/UCLA HEALTH

(From left) Vadim Gudzenko, MD (RES '09), chief of critical care in the Department of Anesthesiology and Perioperative Medicine, Fedra Djourabchi and Dr. John A. Glaspy inspect pallets of medical supplies donated by UCLA Health to be shipped to Ukraine.

It's "our responsibility as a health organization to help not only our own patients, but patients in our global community," Djourabchi says.

UCLA Health has a long history of such engagement. When a devastating earthquake struck Haiti in 2010, a team of doctors and nurses assembled to help. Some went as part of an organized UCLA effort — Operation Haiti — while others traveled on their own or with other non-governmental organizations. In 1999, when war broke out between ethnic Albanians and ethnic Serbs and the government of Yugoslavia in Kosovo, a 26-member UCLA medical team joined with International Medical Corps to deliver care to Kosovar refugees. And for the past six months, UCLA Health recreational therapist Christie J. Nelson has been working on the Poland-Ukraine border to provide aid to Ukrainian refugees fleeing from the Russian invasion of their country (see Epilogue in this issue, "Letter from Medyka," page 60).

> "THE DELIVERY WAS COMPLEX, INVOLVING IMPORT AND EXPORT REGULATIONS AND CUSTOMS IN THREE NATIONS."

Dr. Glaspy was motivated to act in response to what he sees as a disturbing trend in geopolitical dynamics, a situation that has him contemplating history and moral values. "What we see happening in Ukraine is not new," he says. "The bigger picture is that good and evil have been afoot in the world for as long as there's been people. And in my view, evil has been slowly winning."

As further evidence, he calls forth a Pulitzer Prize-winning photo taken during the famine in Sudan in the early 1990s of a frail child who has collapsed trying to reach a feeding station just a half-mile away, while a vulture lurks in the background. "We are in a world where every day there's one of those pictures playing out and there's a vulture that's getting closer and closer," Dr. Glaspy says.

In the end, it comes down to how far each of us is willing to go to try to make a difference. Says Djourabchi, "All the humanitarian efforts we've done — whether in Beirut, Armenia, Haiti and now Ukraine — they all have the mission of healing humankind." ●

***Jocelyn Apodaca Schlossberg** is a senior writer focused on equity, diversity and inclusion for UCLA Health Communications.*

AP PHOTO/ERIC GAY

A child and her father visit a memorial at Robb Elementary School to honor the children and teachers killed in the school shooting in Uvalde, Texas.

WE CAN DO MORE TO PROTECT CHILDREN FROM GUN VIOLENCE

By Moira A. Szilagyi, MD, PhD

ON THE MORNING OF MAY 24, 2022, the students of Robb Elementary School, in Uvalde, Texas, started their day like any other. They tied their shoes, put on their backpacks and said goodbye to their parents and caregivers. They went to school expecting to see their friends, to learn and to prepare for the start of summer break in just a few short days. Many of them received awards for being on the honor roll that very morning.

It should have been an ordinary day.

It was not. The lives of 19 third- and fourth-grade students — ages 9, 10 and 11 — were taken in a horrific display of violence.

On that day, Dr. Roy Guerrero, Uvalde's only pediatrician, was called to the emergency room to help with the injured children. Ultimately, he lost five of his young patients — children he had taken care of for much of their lives.

Helping keep children safe is one of the most essential roles of pediatricians like myself and Dr. Guerrero. We have advocated for car seats and safe-sleep practices. To keep children safe from disease, we encourage vaccinations. We remind our patients to wear their bicycle helmets and suggest their parents monitor their children's social-media use.

We do this because protecting children from preventable injury and death is, perhaps, the most fundamental obligation we owe our young people. But there is a limit to what pediatricians can do in the exam room.

Public policy is an essential tool as well. Across the country, states have established laws requiring the use of helmets, car seats and immunizations to attend school. The federal government also sets critical public policy. Just this year, Congress passed an important law prohibiting dangerous infant-sleep products.

We've made fantastic progress reducing child injury and death from a variety of causes. But not when it comes to guns. In fact, firearms are now the leading cause of death in children, surpassing car accidents. Pediatricians counsel families about gun safety, but the duty to keep children safe extends beyond pediatricians and educators. It is a duty we share as a society.

I am sorry to say, we have failed our children. Every year in the United States, more than 3,500 children and teens die by firearms, including those by suicide. That is like having a Uvalde-scale tragedy every other day. Roughly another 15,000 children and teens are wounded by firearms every year.

Add to that disturbing list an estimated 3 million children who are exposed to gun violence each year. When children are exposed to violence, it leads to increases in stress and anxiety, and decreased physical activity, as a result of feeling unsafe.

The effects of gun violence disproportionately impact communities of color. Black, Hispanic and Indigenous youths are more likely to die from firearm homicide than their white counterparts. Exposure to gun violence in these communities contributes to trauma and health inequities, with lifelong implications that exacerbate unacceptable health disparities.

We can't talk about firearm violence without talking about trauma. Science teaches us that such violence can have life-long negative impacts on physical and mental health and well-being. We owe it to our children to protect them from this trauma.

It is not just the victims of gun violence who experience trauma. Trauma often is the precursor to such violence. A recent study by The Violence Project, a nonprofit and nonpartisan research center focused on violence prevention and intervention, found that 100% of the perpetrators of mass shootings from 1966 to 2019 had a history of childhood trauma — child abuse or neglect, emotional abuse, bullying or exposure to significant violence. Research also shows that childhood trauma can lead to negative changes to the body's stress response; the brain of a traumatized individual is wired to scan for danger and has less capacity for emotional and behavioral regulation.

Not only do we need to do more to directly protect children from firearms, but we also need to identify affected children and engage them in a trauma-informed way and get them the care they need, as well as ensure they cannot access firearms. However, access to mental-health services and trauma-informed care alone will not solve the epidemic of gun violence. Therefore, we have no choice but to also address the availability of firearms for individuals who are at risk for doing harm to themselves or others.

Over the course of three decades as a pediatrician, I have treated five children who were accidentally shot by themselves or another child with a gun that was left unsecured. I once cared for a 2-year-old in the emergency department who died after finding an unlocked, loaded pistol under the couch in his home. I cared for a 14-year-old who died after a bullet pierced his aorta when his best friend accidentally shot him with an unlocked, loaded pistol they were playing with. A teenage girl was shot in the spine by her boyfriend as they pretended to play Russian roulette with a gun they assumed was unloaded; she lost all bodily function below her waist. Two others survived gunshots, but with injuries that will burden them for life. We simply must do more to encourage gun owners, especially those with children, to safely store their firearms.

You might expect that gun violence would touch my professional life as a doctor. But gun violence has also touched my personal life. Three boys I grew up with died by suicide with a firearm when we were teens. One of my brother's best friends was shot in our home by his irate cousin. He was 21, and his wife and my mother were there when it happened. My mother said over and over, "There was so much blood. We couldn't stop the bleeding." He died before the ambulance arrived.

There have been other deaths as well. Mine is not a unique story. Far too many Americans have been affected far too many times by gun violence. We need to do more, and we need to do better.

As some of the examples I've given demonstrate, unsecured firearms are a threat to public safety. A multisite study found that keeping a gun locked and keeping a gun unloaded have protective effects of 73% and 70%, respectively, with regard to risk of both unintentional injury and suicide for children and teenagers. Funding to educate and train health care providers to identify individuals at high risk for suicide, communicate effectively with patients about firearm safety and/or to support suicide-prevention best practices can have a dramatic impact on reducing youth suicide.

> "WHILE WE KNOW SOME OF WHAT WORKS, WE MUST NEVER STOP LEARNING BETTER STRATEGIES TO KEEP OUR CHILDREN SAFE. THEY ARE COUNTING ON US."

In addition to other potential measures, there is a critical need for increased federal investment in gun-violence-prevention research. A recent Centers for Disease Control and Prevention (CDC) report showed that the United States experienced a historic rise in gun deaths in 2020, affecting all age groups and widening existing racial and ethnic disparities in firearm-related deaths across the nation. The dearth of research on how best to prevent firearm-related morbidity and mortality makes the problem difficult to address.

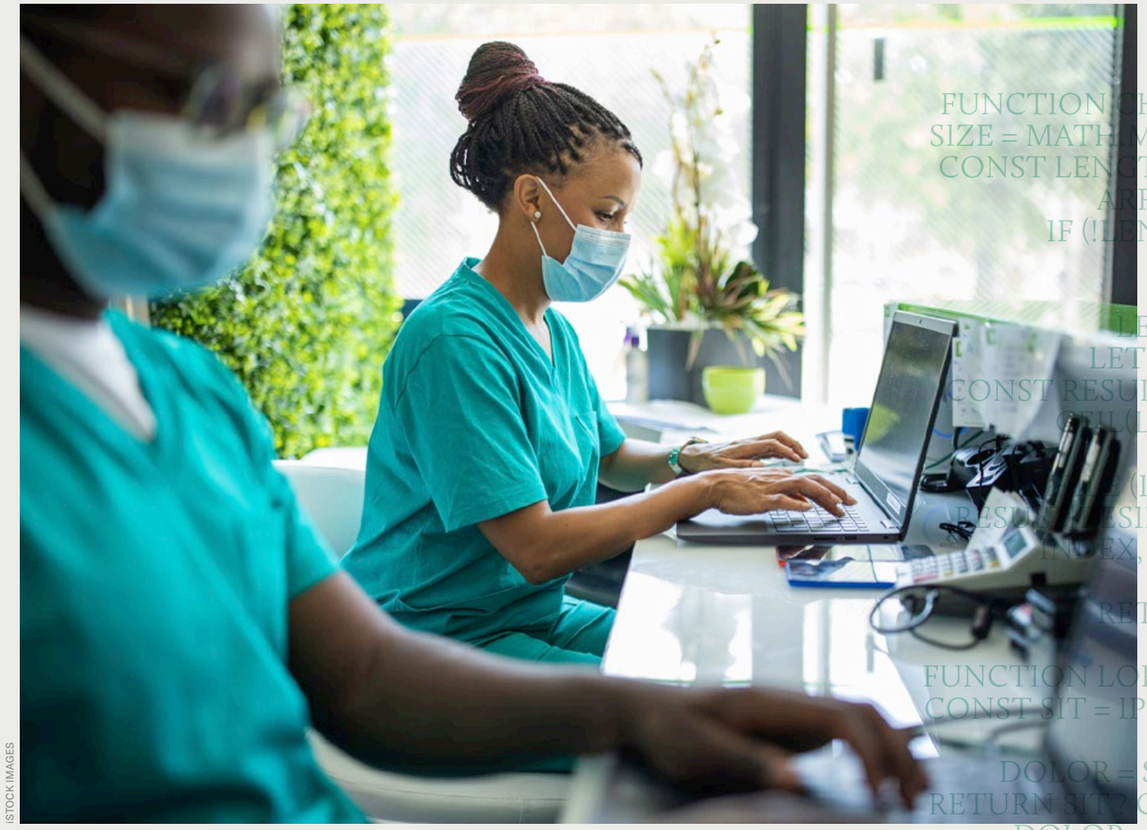
Federally funded public health research has a proven track record of reducing public health-related deaths in instances ranging from motor-vehicle crashes to smoking. This same approach can be applied to increasing gun safety and reducing firearm-related injuries and deaths. Continuing and expanding CDC and National Institutes of Health research will be critical to that effort.

While we know some of what works, we must never stop learning better strategies to keep our children safe. They are counting on us. ●

Dr. Moira A. Szilagyi *is Peter Shapiro Term Chair for the Promotion of Child Developmental and Behavioral Health in the David Geffen School of Medicine at UCLA, chief of the Division of Developmental/Behavioral Pediatrics and president of the American Academy of Pediatrics (AAP). This column is edited from Dr. Szilagyi's testimony on behalf of the AAP before the U.S. Senate Committee on the Judiciary in June 2022.*

CAN ALGORITHMS HELP REDUCE HOSPITAL READMISSIONS?

By Anna Louie Sussman



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CONSUMERS ARE FAMILIAR WITH HOW ALGORITHMS WORK. Amazon, using your prior buying habits, suggests similar purchases. YouTube, based on what you've already watched, offers related videos. The consumer can take it or leave it, and the company has spent little to make the offer. If the algorithms don't work for you, not such a big deal.

But what about in a far more critical setting? One with countless variables, such as a hospital? Algorithms certainly hold out the promise to improve medical decision-making and reduce costs but implementing just one — and there is the potential for thousands in a major medical center — is a complex task and requires careful monitoring of its performance and patient outcomes.

A favorite target of performance-improvement methods — manual or digital — at hospitals is readmissions. When patients have to return to the hospital after a surgery or treatment, it suggests they were discharged in error. Government reimbursement programs often carry penalties for readmissions, and, obviously, there is considerable risk to patients.

In a paper published last year, Eilon Gabel, MD (RES '15), assistant clinical professor of anesthesiology in the David Geffen School of Medicine at UCLA, and UCLA Anderson School of Management's Velibor V. Mišić and Kumar Rajaram explore how best to evaluate possible algorithms, or machine-learning models, that would seek to identify patients at risk of readmission.

Understanding the value of a machine-learning model from a clinical perspective is not straightforward. In machine learning, a commonly used metric is something called the area-under-the-curve (AUC), which addresses the following issue. Suppose we are given a patient who will be readmitted, and a patient who will not be readmitted, but we do not know which is which. What is the chance that the model identifies the higher risk for the patient who goes on to be readmitted than the patient who is not?

If we opted to flip a coin and make a random guess as to which one will be readmitted, we would be right only 50% of the time. If we had a perfect model, we would be right 100% of the time. So, this metric ranges from 50% to 100%. In practice, an AUC of 70% is considered fair, an AUC of 80% is considered good and an AUC of 90% is considered excellent.

But AUC is abstracted from the realities of clinical decision-making. It does not take into account that a provider is using the model to identify patients and is operating under a limited schedule. It does not take into account the cost savings of each readmission that the model correctly anticipates, or the costs of the provider needed to operationalize that model.

Using data on 19,331 surgical admissions to Ronald Reagan UCLA Medical Center during an 847-day period ending in 2018 — and the 969 patients (5% of total) readmitted to the hospital's emergency department within 30 days of being discharged — the goal is to see whether, and how well, machine-learning models could have identified that subset of patients and thus prevented readmissions.

The authors test four machine-learning models and examine their performance at various levels of availability of care providers (physician or nurse). In addition to improving patient outcomes, an algorithm needs to fit into the workflow of care providers and also be cost effective, the authors note.

To be sure, unlimited patient access to a physician or nurse's time would reduce readmissions. The models' job is to stop potential readmissions without wasting those valuable resources on patients who'll do fine after discharge. Surgeons and specialists aren't always available every day, so the authors test the four models under three provider schedules:

- *Provider sees eight patients every Monday.*
- *Provider sees eight patients on Monday and eight on Wednesday.*
- *Provider sees eight patients per day, Monday to Friday.*

Two of the models, for instance, are only applied on the date of a patient's discharge, so that if a patient is discharged on a Tuesday, those models won't select that patient to see a provider on the first two schedules. Thus, they yield lower figures on the "patients seen" metric.

When provider availability is limited, the use of a more sophisticated machine-learning model that incorporates lab test results improves readmission results significantly. As provider availability increases, the difference between a model that uses lab results and one that eschews labs narrows.

Cost savings roughly track readmissions, though provider time is expensive and it reduces savings.

The authors' results show that models that rigidly call for examination, say, on day of discharge, are less valuable for predicting patient readmission and for cost savings.

This could be because care providers aren't available on that day, or, conversely, they may see patients who are discharged on that day, even if that patient is not the most in need of their care.

The authors' simulation model is helpful for hospital administrators and staff as they determine which machine-learning models will be useful for their particular clinical setting and level of staffing and resources. ●

Anna Louie Sussman *is a New York-based freelance journalist. A former staff reporter at* Reuters *and* The Wall Street Journal, *her writing has been published in* The New Yorker *and* The New York Times. *This article originally was published online in* UCLA Anderson Review *(anderson-review.ucla.edu). It is reprinted with permission.*

"A Simulation-Based Evaluation of Machine Learning Models for Clinical Decision Support: Application and Analysis Using Hospital Readmission," *Nature npj Digital Medicine,* June 14, 2021

EATING FOR A HEALTHY PLANET

By Dana Ellis Hunnes, PhD, MPH, RD

MY SUSTAINABILITY JOURNEY BEGAN as a nutrition-science major at Cornell University. It was there that I first learned about the connections between our own personal health and the foods we eat, which led me to become a registered dietitian. Then, in 2008, I was reading the book *Whose Water Is It Anyway*, detailing the many legal fights that occur in the Western U.S. over the rights to water to grow the foods we all need to survive. This eye-opening read led me to research the effects that climate change has on food security — specifically in Ethiopia, a country that depends on rain for most of its food needs.

While in Ethiopia, I met dozens of individuals who had migrated from their farming villages into the capital city, Addis Ababa, because there hadn't been enough rain for them to grow their food. They came to Addis to earn a cash income so they could buy enough imported food to feed their families for that harvest year and pay their land-taxes. They all hoped this move would be temporary and they'd be able to return home during the next harvest season, when the rains should return. For most of these families, farming is their livelihood. Without it, they lose their culture and way of life, and they are at extreme risk for malnutrition. To them, climate stability means everything.

From this experience, I realized just how much climate change will affect humanity's ability to grow enough food for a swelling population. The impacts of an increasingly erratic environment are very apparent in places like Ethiopia, but they also are taking a toll everywhere. In parts of the United States, for example, groundwater is drying up and topsoil is blowing away, potentially leaving us in a situation where our own food security will also be at risk.

And it isn't just that climate change affects our ability to grow food; it's also that the foods we grow and eat affect the environment, sometimes in dramatically negative ways.

For example, it takes 10 times as much land to produce one gallon of cow's milk as it does to produce one gallon of oat milk. Likewise, it is possible to grow 50-to-100 times more calories of plant-based foods, such as wheat, corn or soy, on an acre of land compared with the calories derived from beef raised on that same acre of land. And when you consider the proportion of greenhouse gases that come from animal agriculture — more than that produced by all the cars, planes, trains, and ships in the world — you quickly realize just how much the foods we eat affect the environment.

As I grappled with the difficult realities of the connections between climate and food security in Ethiopia, and globally, I also came to more deeply understand how the foods we eat affect our own health — either contributing to illness or helping to alleviate, or even reverse, chronic diseases such as diabetes, heart disease, stroke and cancer.

By the time I gave birth to my son in early 2014, I already was a plant-based consumer for health reasons. Yet, I couldn't ignore everything I had learned about the food-environment connections. So, I doubled down on plant-based eating for my health, for sustainability and for environmental reasons. I do it for my son and his generation.

When we eat a whole-foods, plant-based diet, we not only can improve our own health, but we also can help the environment support our children's future by reducing the greenhouse-gas emissions produced by farming the food we currently consume while also decreasing the amount of land that is needed to grow it. This change alone can significantly mitigate the need for further deforestation — and we seriously need to protect our greenhouse-gas-scrubbing forests. Additionally, a plant-based diet also significantly reduces the amount of water that is needed to produce our food, which is critical because just 3% of water on Earth is freshwater.

> "WHEN WE EAT A WHOLE-FOODS, PLANT-BASED DIET, WE NOT ONLY CAN IMPROVE OUR OWN HEALTH, BUT WE ALSO CAN HELP THE ENVIRONMENT SUPPORT OUR CHILDREN'S FUTURE."

While it may seem daunting to switch to a more whole-foods, plant-based diet, it is not as difficult as it might first appear. Rather than choosing meat or dairy, there now are so many options for plant-based proteins and non-dairy milks that nearly everyone can find something that will suit their palate. Making this change will significantly reduce the amount of land and water needed for one's meat-centric meals, and it also will cut one's personal carbon footprint by the equivalent of 250 gallons of gasoline per year and one's water footprint by the amount it takes to fill an Olympic-sized pool. On top of that, it also can save a significant amount of money. Reducing food waste by planning plant-based meals ahead of time can save a family roughly $1,000 a year — and also further reduce the amount of greenhouse gas generated by wasted food that ends up in a landfill.

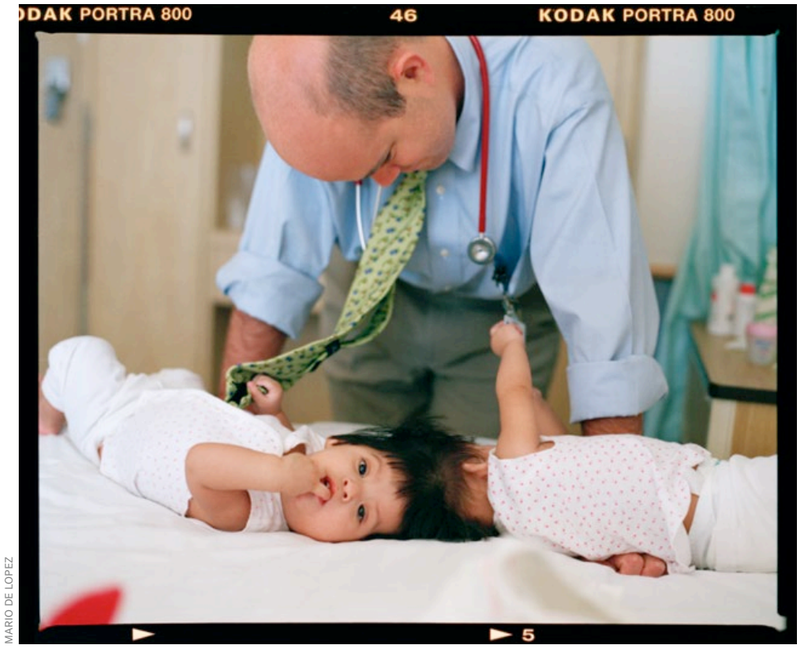
I recognize that making the shift from a diet heavy with animal products to one that is based primarily on plants can be difficult, and I am not advocating that everyone abandons meat and dairy entirely — perhaps reduce consumption by making it a condiment and not the main item on the plate. My own evolution did not happen overnight. It took me a long time to realize how the choices we make about what to eat can either harm or benefit our health and the environment. The knowledge I've gained has made me healthier and more environmentally conscious. Now, I choose to let the future of the planet be my motivation. ●

Dr. Dana Ellis Hunnes *is a senior dietitian at UCLA Health and adjunct assistant professor of community health sciences at the UCLA Fielding School of Public Health. She is the author of* Recipe for Survival: What You Can Do to Live a Healthier and More Environmentally Friendly Life *(Cambridge University Press, 2022). This essay is adapted from its original version published online at mindbodygreen.com.*

A woman sifts through grain at a market on the outskirts of the Ethiopian capital, Addis Ababa.

AP PHOTO/KAREL PRINSLOO

The Tale of The Little Marias



MARIO DE LOPEZ

TWENTY YEARS AGO this past August, the world watched as UCLA surgeons operated to separate conjoined twin girls who had affectionately become known as "The Little Marias." The babies — Maria de Jesús and Maria Teresa Álvarez, craniopagus twins fused at the skull facing opposite directions — were born the previous July in a rural region of southwest Guatemala and brought to UCLA under the auspices of an international nonprofit, Mending Kids International, that helps provide advanced surgical care to children in need across the globe.

The exquisitely complex surgery to separate the girls on August 6, 2002, took more than two months to plan and nearly 24 hours to complete. Their care before, during and after the operation involved hundreds of health care workers — surgeons, pediatricians, nurses, radiologists, anesthesiologists, interns, residents, technicians and social workers. It was the largest single medical team ever assembled in UCLA's history.

Today, Maria de Jesús, known as Josie, and Maria Teresa, or Teresita, are two, distinct young women, each living her own life with their adoptive families in Los Angeles, where they returned after it became clear that they could not receive the ongoing care they would need in Guatemala. On July 25, they turned 21 years old.

TOP: Twins Maria Teresa and Maria de Jesús with their mother, Alba Leticia Álvarez.

BOTTOM: Hundreds of UCLA health care workers were involved in the care of the twins, including pediatric neurology resident Peter F. Morrison, MD (RES '03, FEL '06).

Over the years, Josie and Teresita have periodically returned to UCLA to volunteer with a project to brighten the lives of young patients. Most recently, Josie was at UCLA Mattel Children's Hospital for her Once Upon a Room project, a nonprofit she created when she was 12 years old with her best friend, Siena Dancsecs, and adoptive mother, Jenny Hull, to make over the rooms of pediatric patients and decorate them like the colorful bedrooms they might have at home. On this day, they transform the room of one 8-year-old girl from plain hospital white to Hello Kitty hot pink, complete with colorful comforters, banners bearing the girl's name and a spangled cat-shaped purse that the youngster immediately wraps in a joyous hug. "You definitely put a smile on her face," the girl's mother says.

The team decks out a second room in green with a baseball theme, including a new mitt for the hospitalized child. Another is turned into a turquoise unicorn wonderland, with tassels hanging from the ceiling and a plush unicorn toy on the bed. By the time the decorating is done, the child in the room is wearing a unicorn headband and glittery pink wings.

"It makes the kids so happy," Josie says. "I know how the kids feel when it's just blank, with no decoration."

As she makes her way down the hall, a nurse calls out to her: "I know you!" "All the nurses know me because my sister and I were separated here," Josie says.

While both young women have physical limitations, Teresita has faced more health complications than her sister. A bout with meningitis shortly after the sisters returned to Guatemala following their surgery left her non-verbal and reliant on a wheelchair. "[Maria Teresa] has faced a lot of circumstances you could not see her surviving from, but she's come a long way," her adopted sister, Vivian Cajas, said at the girls' quinceañera in 2016.

Josie has graduated from high school and is looking toward college, preferably UCLA and a future career as a child-life specialist. Though she still contends with health and mobility challenges and uses a specialized scooter to get around, she's outgoing, with an easy, warm smile. "She sees everything through happiness," Hull says.

Perhaps that is because The Little Marias were immediately embraced with love and joy when they arrived at UCLA as infants, and that has endured over the years. "The nursing team — unknown, anonymous, some of the many beautiful people on staff —put two cots together and dropped the divider in between," recalls Jorge Lazareff, MD, then the chief of pediatric neurosurgery and leader of the team that cared for the twins and now emeritus professor of neurosurgery.

"They cushioned with pillows all four sides of the cot so the girls would not bump into each other. Maria Teresa was facing one way and Maria de Jesús was facing the other side, almost 180 degrees. One of the nurses got a mirror and put the mirror in front of Maria Teresa so she could see her sister. And I think that perhaps was the first time they saw each other's face."

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The formerly conjoined Guatemalan twins Teresita (left) and Josie Álvarez now live with adoptive parents in Southern California, and they visit each other several times a week and Skype regularly with their parents in Guatemala.

Kindness continues to be the hallmark of the twins' experience at UCLA, Hull says. Dr. Lazareff has come to many of the twins' birthday celebrations, and Hull is still connected to members of the hospital staff who went out of their way to share kindness and support. She recalls custodial workers who "came in every day they were at work. They were probably the biggest joy during our time being there because they weren't who you expect to be the pick-me-up people."

Yancy Tate is one of those angels. He started working at UCLA shortly before The Little Marias arrived. As soon as he saw them, "I knew I had to take care of them," he says. He brought in foam mats so the girls could safely play on the floor. "From that point on, I was in there every day," he says. "Those are my Guatemalan twin babies."

When the twins turned 10 years old, Dr. Lazareff reflected on the cooperation and teamwork it took to care for Las Mariítas del Milagro — the little miracle Marias. "The story of Maria Teresa and Maria de Jesús Quiej Álvarez brings me back to the first stanza of *Questions From a Worker Who Reads*, by Bertolt Brecht," he wrote in an article for this magazine. "'Who built Thebes of the seven gates?/In the books you will find the names of kings/Did the kings haul up the lumps of rock?' This," Dr. Lazareff wrote, "is the beauty of medicine: It assembles people with different understandings of the realities of life and knits them together in a united effort to do the difficult work of helping to heal a stranger in need."

— Sandy Cohen

To read the original story of "The Little Marias" published 20 years ago in *UCLA Magazine*, go to: tinyurl.com/The-Little-Marias

Examining Racial Differences in Children's Chronic Kidney Disease

CHILDREN WITH CHRONIC KIDNEY DISEASE (CKD) are at an increased risk of developing a sometimes-debilitating bone disease that falls under the umbrella term chronic kidney disease-mineral and bone disorder, or CKD-MBD. Intriguingly, the severity of CKD-MBD and the success of treatment appear to be affected by the race and ethnicity of patients, according to studies conducted by a UCLA researcher.

The work by Marciana L. Laster, MD (FEL '17), assistant professor-in-residence of pediatric nephrology, could inform new treatments for children with kidney disease based on their own unique genetic makeup.

CKD-MBD arises because faulty kidneys don't appropriately balance the levels of various hormones and minerals in the bloodstream and body that are necessary for good bone health. Poorly functioning kidneys lead to the reduced conversion of vitamin D, a hormone necessary for strong bones, into a chemical, calcitriol, that helps the intestines absorb calcium.

This is one factor that contributes to a considerable increase in parathyroid hormone (PTH), a hormone that weakens bones at the excessive levels experienced in CKD. Because the bones of children are growing and developing, CKD-MBD is especially serious in its impact on bone turnover, when bone tissue is broken down and the minerals are absorbed into the bloodstream.

"Children and adults with CKD can have bone turnover that is too high or too low, and this may change over time, causing them to cycle between stages of normal, high or low bone turnover," Dr. Laster says. "In addition, our pediatric patients also have a mineralization defect, meaning they have trouble incorporating bone-building calcium and phosphate into strong healthy bone."

This combination of abnormal turnover and mineralization, she says, contributes to high fracture risk, short stature and deformities. "More important is the fact that the bone disease interacts with the blood vessels and heart and causes our children to die from cardiovascular disease at rates much higher than healthy children. Because of this long-term impact, accurately treating this disease is very important," she says.

Current treatments for CKD-MBD involve what Dr. Laster calls a "one-size-fits-all approach." Most often, patients are given medications that suppress PTH. "My research into racial differences demonstrates that this blanket approach is not sufficient and could potentially drive disparities in mortality," Dr. Laster says.

Indeed, Dr. Laster's studies suggest that Black children may be prone to overtreatment of their bone disease, leading to low bone turnover. Owing to the potential difficulty of incorporating calcium into bone that is slowly turning over, this particular form of bone disease is associated with higher risk of mineral deposits on the walls of arteries and veins.

"My research into racial differences demonstrates that this blanket approach is not sufficient and could potentially drive disparities in mortality."

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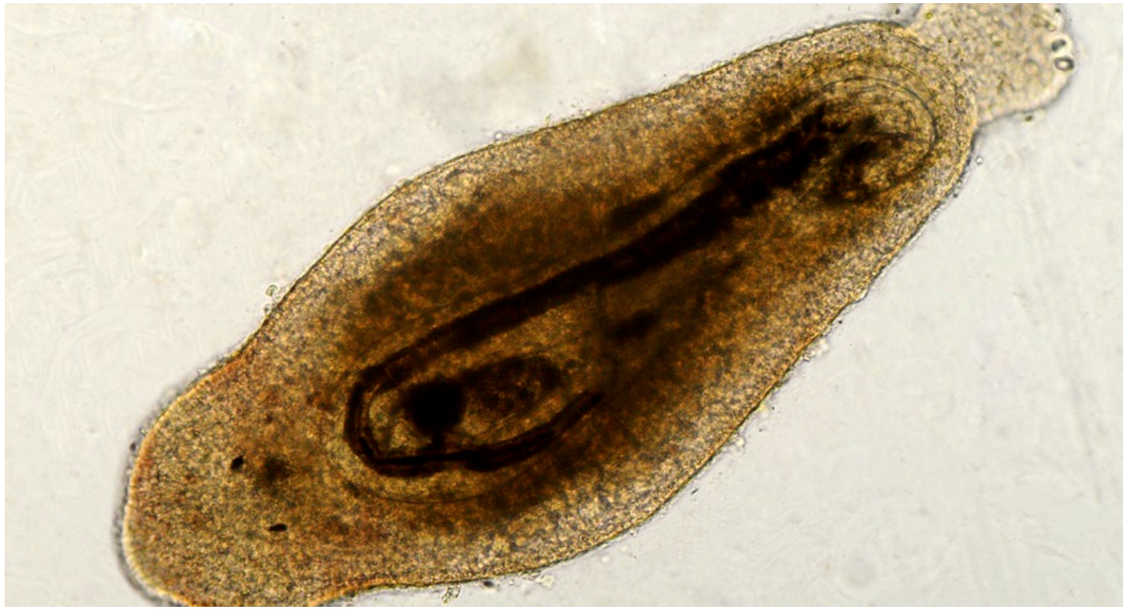
Dr. Laster and her colleagues are now investigating how genetic-level differences in children with CKD influence their bone disease. "My work has largely investigated differences by racial group, but race is a generally flawed social construct — race tends to represent the societal impact on health rather than the biological impact of belonging to any particular group," she explains. "My current research seeks to find genetic markers that determine how CKD-MBD manifests.

"Once we understand which variants are important, we can tailor treatment according to a patient's genetic makeup and their unique biology. The hope is that my findings will alter how we treat our patients."

— Kathy Svitil

"Genetic Variants Associated with Mineral Metabolism Traits in Chronic Kidney Disease," *The Journal of Clinical Endocrinology & Metabolism,* May 19, 2022



ISTOCK IMAGES

Photomicrograph of a planarian flatworm.

How Sex Chromosomes May Have Emerged in Evolution

PREVIOUSLY, SCIENTISTS HAD THEORIZED THAT human sex chromosomes arose in the distant past when a pair of autosomes (non-sex chromosomes) underwent a series of specific changes. Mathematical modeling supported this theory. Yet something crucial was missing. "Most prior studies looked at animal species in which the two sex chromosomes were already highly differentiated. Direct evidence of a transition from autosomes to sex chromosomes was lacking," says Longhua Guo, PhD, a postdoctoral research fellow.

A study by Dr. Guo and other UCLA researchers offers fresh insights into how our evolutionary ancestors came to develop X and Y sex chromosomes. Rather than studying fish or flies, Dr. Guo zeroed in on a particular type of planarian — a flatworm. This planarian has a characteristic that made it a good candidate for study: It is a hermaphrodite, having both male and female sex organs in the same body.

The first step was to map the planarian's genome — the full set of genetic instructions found inside a cell. "Before, we had an incomplete genome sequence that was in a bazillion pieces. You couldn't put together entire chromosomes," says Leonid Kruglyak, PhD, Distinguished Professor of Human Genetics and Biological Chemistry and Diller – von Furstenberg Endowed Chair in Human Genetics. "Now, we have a great resource for anyone studying planarians."

"We think we have caught evolution in the act."

As the researchers investigated the planarians, one pair of autosomes stood out. "These autosomes are not sex-determining at this point," Dr. Kruglyak says. "Yet, they look like they may be sex-primed. In other words, they are starting to show some features that may mark the early evolution of sex chromosomes."

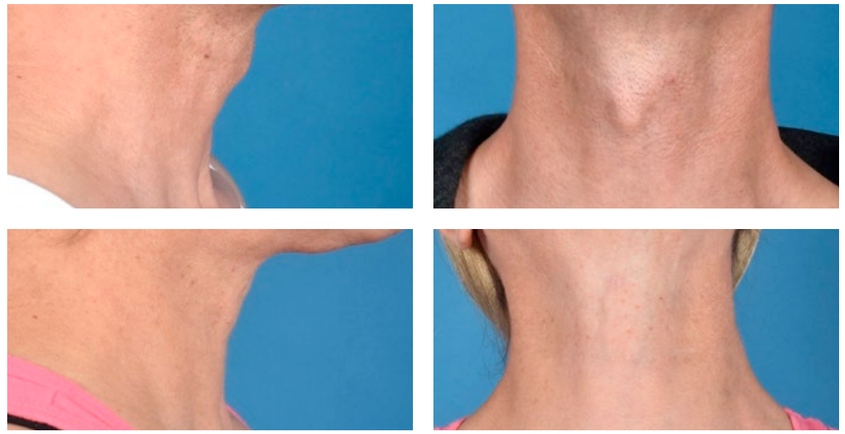
Specifically, these autosomes showed suppression of recombination and genetic divergence. In most chromosome pairs, genetic material is exchanged through a process called recombination. In sex chromosomes, however, most of the Y no longer shares material with the X. Likewise, in the key pair of planarian autosomes, a big portion of each has stopped sharing material with its counterpart. These large portions are genetically distinct. Interestingly, they contain many genes that function only in one sex or the other.

Does this mean that the planarians are partway down the path of evolving from hermaphrodites into two separate sexes determined by sex chromosomes? Only time will tell for sure, Dr. Kruglyak says. "We think we have caught evolution in the act."

— UCLA Health

"Island-Specific Evolution of a Sex-Primed Autosome in a Sexual Planarian," *Nature,* June 1, 2022

Scarless Surgery to Reduce Adam's Apple



COURTESY OF UCLA GENDER HEALTH PROGRAM

Photos of one patient before (top row) and after (bottom row) surgery to reduce the size of the Adam's apple without a visible scar.

ALTHOUGH THERE ARE SEVERAL GENDER-AFFIRMING procedures that can be addressed through hormone-replacement therapy, the Adam's apple is one of a few anatomical features that can only be treated with surgery. The traditional tracheal shave procedure involves making an incision in the neck and then using stitches to close it up. Now, doctors at the UCLA Gender Health Program have developed a technique to reduce an Adam's apple bump without leaving a scar on the patient's neck.

The advance could be an important and welcome one for transgender women and nonbinary people, for whom a neck scar can be a telltale sign of their surgery — often exposing them to discrimination, hate and violence.

After reviewing outcomes for 77 people who underwent the surgery at UCLA Health facilities, the UCLA physicians concluded that the procedure is an effective way to optimize care for people receiving gender-affirming surgery. Specifically, they found that the procedure — which can be performed in 90 minutes — is effective at removing the Adam's apple, that it can be performed using only the equipment already available in most surgical suites in addition to a few other inexpensive tools, and that it could be readily adopted by plastic surgeons and head and neck specialists.

The procedure is called "scarless" tracheal shave, thanks to the lack of a scar on the patient's neck, although it does, in actuality, create a small, hidden scar on the inside of the patient's lip. That's the location through which a surgeon inserts cartilage-trimming forceps and a polishing tool to shave down the extra cartilage that forms the Adam's apple.

"There will always be a scar with any surgery, but this procedure creates a scar that only a dentist would see," says Abie Mendelsohn, MD '06 (RES '11, FEL '11), associate professor of head and neck surgery. "It represents a massive shift in the ability to provide optimal gender-affirming care for patients."

The study found that there were no voice changes or damage to the vocal cords among the patients, but further research is needed to corroborate those results, and to understand what effects the UCLA-developed technique might have on patients' quality of life and mental health.

Dr. Mendelsohn says many transgender people fear going about the activities of daily life due to the threat of being "clocked," or identified as a trans person by others, against their wishes. "When we live in fear, that's really no life at all," he says. "With this original approach, we have the opportunity to surgically treat fear, and that's an incredibly rewarding aspect of the work we do."

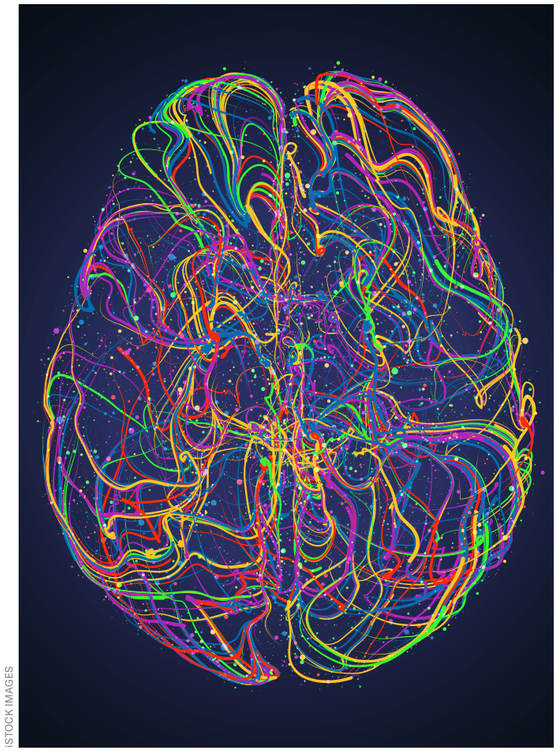
— Evelyn Tokuyama

"There will always be a scar with any surgery, but this procedure creates a scar that only a dentist would see."

"Transoral Feminizing Chondrolaryngoplasty: Development and Deployment of a Novel Approach in 77 Patients," *Facial Plastic Surgery & Aesthetic Medicine,* June 14, 2022

How the Brain Links Memories

OUR BRAINS RARELY RECORD SINGLE MEMORIES. Instead, they store memories in groups so that the recollection of one significant memory triggers the recall of others that are connected chronologically. As we age, however, our brains gradually lose this ability to link related memories. Now, UCLA researchers have discovered a key molecular mechanism behind this memory linking. They've also identified a way to restore this brain function genetically in aging mice — and an FDA-approved drug that achieves the same thing.



ISTOCK IMAGES

The findings suggest a new method for strengthening human memory in middle age and a possible early intervention for dementia. "Our memories are a huge part of who we are," says Alcino J. Silva, PhD, Distinguished Professor of Neurobiology and Psychiatry. "The ability to link related experiences teaches us how to stay safe and operate successfully in the world."

The UCLA team focused on a gene that encodes a receptor for CCR5 molecules — the same receptor that HIV hitches a ride on to infect brain cells and cause memory loss in patients with AIDS. As people age, the amount of CCR5 expressed in the brain rises, and, as Silva's lab has demonstrated in earlier research, increased CCR5 gene expression reduces memory recall.

"Our memories are a huge part of who we are. The ability to link related experiences teaches us how to stay safe and operate successfully in the world."

Which begs the question: Why does the brain need a gene that interferes with its ability to link memories?

"Life would be impossible if we remembered everything," Dr. Silva says. "We suspect that CCR5 enables the brain to connect meaningful experiences by filtering out insignificant details."

In the current study, Dr. Silva and his colleagues discovered a key mechanism underlying mice's ability to link memories of their experiences in two different cages. They found that boosting CCR5 gene expression in the brains of mice interfered with memory linking. The animals forgot the connection between the two cages. But when the scientists deleted the CCR5 gene in the animals, the mice were able to link memories that normal mice could not.

Dr. Silva had previously studied the drug maraviroc, which the U.S. Food and Drug Administration approved in 2007 for treatment of HIV infection. His lab found that maraviroc also suppressed CCR5 in the brains of mice. "When we gave maraviroc to older mice, the drug duplicated the effect of genetically deleting CCR5 from their DNA," says Dr. Silva, who also is a member of the UCLA Brain Research Institute. "The older animals were able to link memories again."

The finding suggests that beyond reversing the cognitive deficits caused by HIV infection, maraviroc can also be used to help restore middle-aged memory loss. "Our next step will be to organize a clinical trial to test maraviroc's influence on early memory loss with the goal of early intervention," Dr. Silva says. "Once we fully understand how memory declines, we'll possess the potential to slow down the process."

— Elaine Schmidt

"CCR5 Closes the Temporal Window for Memory Linking," *Nature,* May 25, 2022

Off-the-Shelf Immune Cells to Combat COVID-19

WHILE VACCINATIONS ARE CRITICAL FOR CONTROLLING COVID-19, a percentage of vaccinated individuals can become infected with the novel coronavirus, especially as it evolves. The situation is compounded by the continual emergence of new variants and subvariants with the ability to evade even a vaccination-primed immune response. What's needed are treatments for combatting SARS-COV-2 infection after the virus takes hold in the body.

To that end, a team of UCLA researchers has genetically engineered a normally uncommon type of immune-system cell — one that can safely and effectively destroy SARS-CoV-2, the virus that causes COVID-19 — so the cell is produced in vast quantities.

Lili Yang, PhD, associate professor of microbiology, immunology & molecular genetics and a member of the Eli and Edythe Broad Center of Regenerative Medicine and Stem Cell Research at UCLA, and her team focused on a rare subpopulation of the immune system's T cells known as invariant natural killer T cells, or iNKT cells. iNKT cells are exceedingly effective at targeting and destroying viruses and other foreign invaders, but they are found in vanishingly low numbers.

> "The engineered cells have unique properties that make them promising for off-the-shelf therapy, meaning they can be given to any patient, regardless of their genetic makeup."

Notably, iNKT-cell populations are reduced even further in patients with severe COVID-19 infection. Indeed, significantly reduced numbers of iNKT cells — and whether or not they are activated — is predictive of disease severity in a patient, which indicates that these cells are involved in COVID-19 control. That suggested to the researchers that increasing the number of iNKT cells might help patients eliminate virus-infected cells and mitigate disease progression.

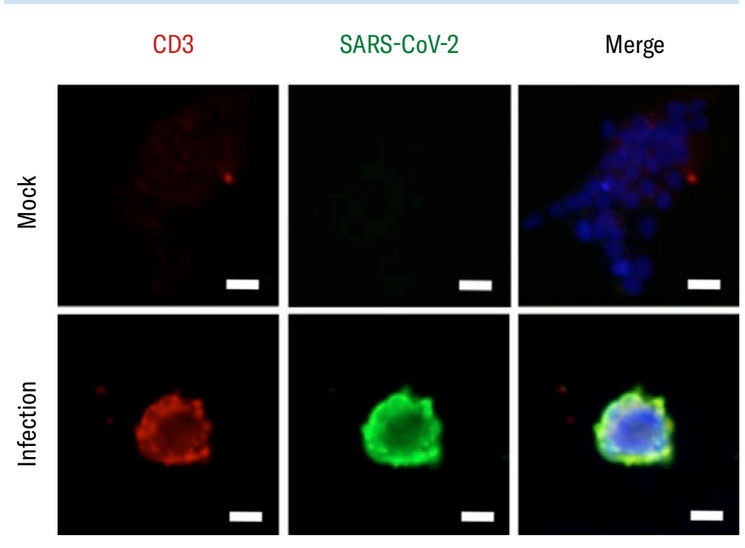
Dr. Yang and her team genetically engineered hematopoietic stem cells (HSCs) — stem cells that give rise to all blood cells — so they would preferentially differentiate into iNKT cells, and in very high numbers. From a single cord-blood donor, more than 1,000 therapeutic doses of HSC-iNKT cells can be generated.

In cell cultures and in animal models, these new HSC-iNKT cells "selectively killed cells infected with SARS-CoV-2, and they also eliminated inflammatory immune cells that are associated with the immunopathology of severe COVID-19," says molecular biologist and immunologist Yanruide (Charlie) Li, PhD, a postdoc in Dr. Yang's lab.

The engineered cells, Dr. Yang says, "have unique properties that make them promising for off-the-shelf therapy, meaning they can be given to any patient, regardless of their genetic makeup." In contrast to other T-cell therapies, HSC-iNKT cells do not cause graft-versus-host disease and are resistant to host rejection, and thus provide a key therapeutic window to effectively prevent viral spread in all patients.

"The most exciting result of this work is that HSC-iNKT cells can be produced on a massive scale and administered to many patients in need of new treatments," says Zachary Dunn, a PhD candidate at USC and visiting graduate researcher in Dr. Yang's lab.

— Kathy Svitil

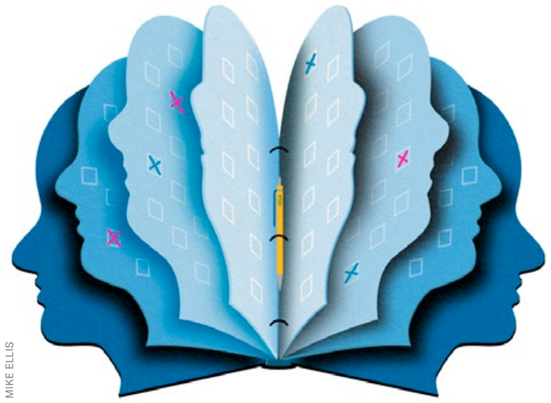


COURTESY OF DR. LILI YANG AND DR. YANRUIDE LI

The blue color indicates the nucleus of virus target cells. Once these target cells are infected by SARS-CoV-2 virus (shown in green), engineered HSC-iNKT cells (shown in red) will cluster with and kill the virus-infected cells.

"Development of Off-the-Shelf Hematopoietic Stem Cell-Engineered Invariant Natural Killer T Cells for COVID-19 Therapeutic Intervention," *Stem Cell Research and Therapy*, March 21, 2022

Quick-Screening Tool Facilitates Faster Dementia Diagnosis



MIKE ELLIS

FOR PEOPLE WITH DEMENTIA AND THEIR CAREGIVERS, taking early action to manage the challenges of the condition can lead to an improved quality of life. Yet, many people with dementia are not diagnosed until the later stages, says Timothy S. Chang, MD (RES '18, FEL '20), PhD, assistant professor of neurology. "The reasons for that may include the stigma attached to Alzheimer's disease or people thinking cognitive issues are a part of normal aging. Another reason is that primary care providers [PCPs] do not have enough time to ask about cognitive health," he says.

To address the latter issue, Dr. Chang and his team developed a brief questionnaire designed to help PCPs screen for dementia in less than five minutes.

Dementia is characterized by impaired memory, language and thinking skills. About one-in-nine Americans age 65 and older lives with dementia due to Alzheimer's disease, the most common form. Latino and Black Americans are at particular risk. They are one-and-a-half-to-two times more likely than white Americans to develop dementia, yet many are not diagnosed until later in the disease. By that time, functional decline and caregiver burden may already be taking a heavy toll.

One aim of the new screening tool is to improve the detection of dementia in these underserved groups with a version created specifically for Latino patients, translated into Spanish and reviewed to accurately assess cognitive health with cultural competence.

The tool consists of three questions about changes in memory/thinking, language or personality within the last five-to-10 years. Each comes with examples of common changes to prompt accurate responses. For instance, examples of memory/thinking changes include trouble recalling recent events and repeating oneself often.

The screening is designed to be done annually in patients age 60 and older. There are two forms of the questionnaire: The patient completes one and the other is designed to be completed by someone who knows the patient well, such as a family member.

"Many patients with early cognitive issues will not say or believe they have any issues. Having input from an informant who knows the patient well can be very helpful," Dr. Chang says.

But because an informant is not always available, the PCP can also conduct a very short psychological test called the Mini-Cog. This test is already well-established in clinical use.

A "yes" answer to a question (or a positive Mini-Cog score) cannot in itself diagnose dementia. But it does prompt the clinician that more assessment is needed. The PCP can then do further workup or refer the patient to a specialist.

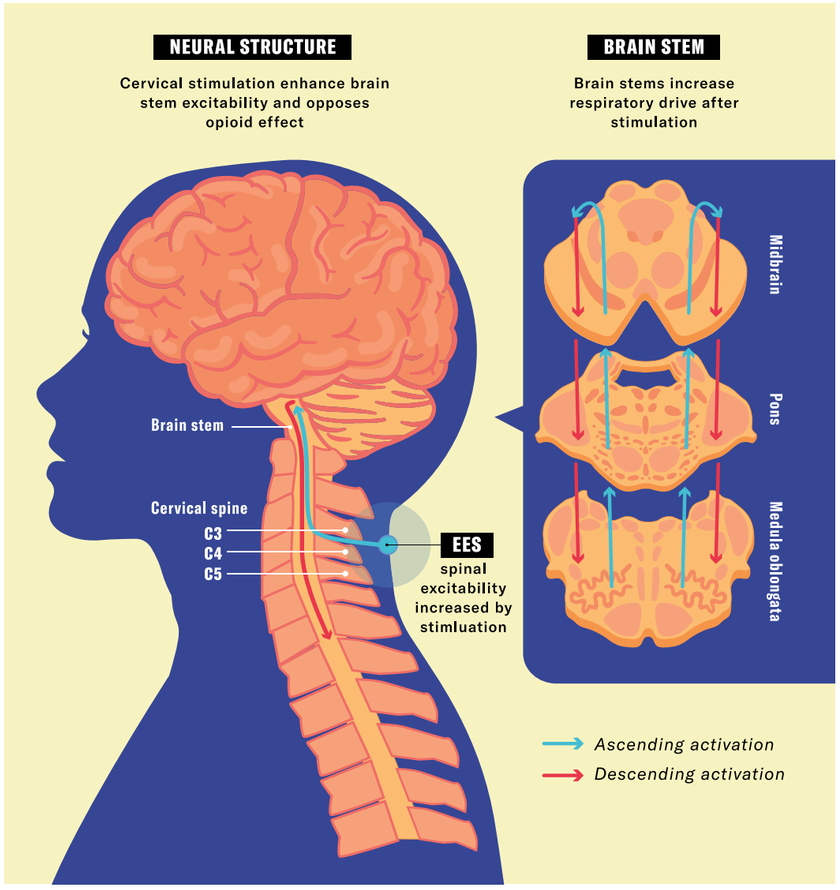
"Timely diagnosis of dementia is important for several reasons," Dr. Chang says. "There are medications that can delay some symptom progression. There are also numerous drugs in clinical trials."

In addition, Dr. Chang says, we know that controlling conditions such as heart disease and high blood pressure can help delay the progression of certain types of dementia. "That may give patients another motivation to stay on top of their health," he says.

— UCLA Health

> "Many patients with early cognitive issues will not say or believe they have any issues."

An Electrical Pulse Can Jump-Start Breathing following Opioid Use



VALENTINA D'EFILIPPO

OPIOID USE CAN LEAD TO DEATH by suppressing respiratory activity. These problems can occur from street-use of the drugs, but also as post-operative complications from anesthesia because opioids desensitize the brain stem to rises in carbon dioxide. Current treatments, such as manual lung inflation and medication, can work in the short term to combat breathing problems following opioid use, but getting patients to breathe independently remains a challenge.

Now, UCLA research points to a novel intervention for respiratory depression associated with opioid use that could offer an alternative to pharmacological treatments, which can cause withdrawal symptoms, heart problems and negatively affect the central nervous system. The therapy, called epidural electrical stimulation (EES), administers electrical pulses to the back of the neck, helping patients regain respiratory control following high-dosage opioid use.

EES administered at the cervical spinal cord activates a network of neurons in the brain stem that stimulates and coordinates respiratory muscles and improves the rate and depth of breathing.

The UCLA researchers targeted sensory-motor circuits in the cervical spinal cord of 18 patients with degenerative spine diseases who were anesthetized for surgical treatment. They delivered 30 Hertz of EES to the cervical spinal cord continuously for no longer than 90 seconds and found that short periods of continuous, low-intensity EES not only increased the volume of breath, but also actively controlled the frequency and rhythm during opioid-induced breathing problems. The rhythmic breathing pattern was sustained briefly after the EES stopped in the presence of high-dose opioids.

"Our results provide proof of principle that cervical EES could improve respiration following opioid use," says Daniel C. Lu, MD, PhD, vice chair of neurosurgery. "We can compare the human body to a car; our goal is to jump-start the body so it can run by itself without periodic pushes."

Future trials in humans with larger cohorts will be conducted to determine if EES can alleviate or reduce the need for ventilator support in acute pathological conditions such as opioid-induced respiratory depression; stroke; and traumatic brain, brain stem or spinal cord injury. "We hope to use EES to provide novel approaches to restore breathing as we are now using defibrillation devices for restoring cardiac activities," Dr. Lu says.

— Elaine Schmidt

"Epidural Electrical Stimulation of the Cervical Spinal Cord Opposes Opioid-Induced Respiratory Depression," *The Journal of Physiology*, May 31, 2022

Understanding and Preventing Blindness in Premature Babies

ONE-IN-10 VERY PREMATURE INFANTS — those born at less than 30 weeks gestation — are affected by retinopathy of prematurity (ROP), the leading cause of childhood blindness. During fetal development, the blood vessels of the retina grow steadily out from the center of the eye toward its periphery, only reaching those edges when the fetus is close to full-term gestation. If the baby is born early, this process is disrupted, which raises the risk for retinal detachment and consequent blindness.

The infection and inflammation experienced by many premature infants can affect normal retinal blood-vessel growth. So, too, can the relatively high oxygen levels that are commonly administered after delivery, says Alison Chu, MD, assistant professor of pediatrics and neonatology.

Immediately following delivery, the amount of oxygen available to the newly born premature infant may suddenly increase to levels that are potentially toxic. This condition, known as hyperoxia, may lead to the narrowing of retinal blood vessels, or vascular attenuation. It is then often followed by local hypoxia, or low oxygen levels, which encourages the growth of new blood vessels but at an aberrant pace and pattern that may actually lead to retinal detachment.

In recent years, Dr. Chu and her colleagues have been taking a detailed look at the mechanisms behind these processes in both humans and animal models. The work could lead to the development of both preventive and therapeutic strategies to reduce risk of ROP development, and to improve long-term neurovision outcomes for premature babies.

> "We are interested in understanding how retinopathy of prematurity may result in long-term adverse visual outcomes."

Studies by Dr. Chu and others have shown several key genes that help drive retinopathy, including hypoxia-inducible factor one alpha (Hif1a) and vascular endothelial growth factor (VEGF). "My group is particularly interested in studying a protein called epithelial membrane protein 2 [EMP2], which may regulate these vascular-growth factors," she says.

The EMP2 gene is involved in regulating angiogenesis — the growth of new blood vessels. This normally vital role becomes problematic in ROP, however, where excessive blood vessel formation can lead to retinal detachment. In a recent paper, Dr. Chu and her colleagues showed that mice that were genetically engineered to not express the EMP2 gene (so-called "EMP2 knock-outs") were protected against oxygen-induced retinopathy.

"We are interested in understanding how this could be translated to therapy in human babies," she says. "Moreover, we are interested in understanding how retinopathy of prematurity may result in long-term adverse visual outcomes, by studying the vascular and neuronal changes both during active disease and in the long-term."

To do so, Dr. Chu's laboratory has teamed up with Tzung Hsiai, MD, PhD, professor of bioengineering at the Samueli School of Engineering at UCLA. They are tracking the progression of oxygen-induced retinopathy in mice using advanced imaging techniques that offer deep and three-dimensional insight into disease progression in animal models. "As a field, we are understanding more and more how early-life exposures affect later adult outcomes," Dr. Chu says, "and I think it's important to consider not only the short-term, but the long-term effects of the treatments we use in neonatology."

— Kathy Svitil

"Epithelial Membrane Protein 2 (EMP2) Promotes VEGF-Induced Pathological Neovascularization in Murine Oxygen-Induced Retinopathy," *Investigative Ophthalmology & Visual Science*, February 2022

ISTOCK IMAGES

Gene on Y Chromosome may Explain Men's Lower Risk for Pulmonary Hypertension

ISTOCK IMAGES

A UCLA STUDY HAS IDENTIFIED A GENE ON THE Y CHROMOSOME that protects against pulmonary hypertension, a rare and potentially fatal disease that occurs four times more often in women than men. A chronic disease characterized by high blood pressure affecting the lung arteries and heart, pulmonary hypertension appears most often in young women. It has no definitive cure, and many patients eventually require a lung transplant. Being male is the single biggest factor in avoiding the development of pulmonary hypertension.

Typically, men have one X and one Y chromosome on the 23rd pair while women have two X chromosomes. Previous research from the group doing the current study found that women have higher rates of pulmonary hypertension because they lack the Y chromosome's protective features. But the gene responsible for that protection had not been identified. In the new study, researchers aimed to further understand how the Y chromosome confers protection against the disease.

To conduct the experiment, which was done in mice, researchers silenced each gene in the Y chromosome, one by one, to tease out which is linked to the development of pulmonary hypertension. After observing each gene's function, the researchers found that the gene Uty stops an inflammatory pathway in the lungs in male mice and thereby halts development of the disease.

> "This study will help researchers realize that inflammation is not just associated, but can also be causal in this disease, and it could be a very promising or exciting new avenue for therapy."

The researchers also induced pulmonary hypertension in female rats and then treated them with AMG-487, a drug that blocks inflammation and was developed as a treatment for psoriasis. After dosing the rats twice a day for two weeks, the researchers found that AMG-487 was effective in treating pulmonary hypertension by blocking the inflammation that leads to the disease.

Christine M. Cunningham, PhD, a former graduate student at UCLA who is now at Stanford, says because AMG-487 has already passed a Phase I clinical trial for safety, there's a likelihood the drug can now be studied in clinical trials of patients suffering from pulmonary hypertension. "This study will help researchers realize that inflammation is not just associated, but can also be causal in this disease, and it could be a very promising or exciting new avenue for therapy," Dr. Cunningham says.

— Kelsie Sandoval

"Y-Chromosome Gene, Uty, Protects Against Pulmonary Hypertension by Reducing Proinflammatory Chemokines," *American Journal of Respiratory and Critical Care Medicine,* May 31, 2022

Microchip System Examines Migraine-Sleep Relationship

MIKE ELLIS

CORTICAL SPREADING DEPRESSION, OR CSD, is a wave of brain activity responsible for migraine aura — a warning symptom such as visual disturbance or flashes of light that often occur before or with the crushing headache. "CSD has been commonly used as a model of migraine in mice or rats because it is something that seems to be predictive," says Andrew C. Charles, MD '86 (RES '90, FEL '92), director of the UCLA Goldberg Migraine Program. "Not only can it tell us about the mechanisms of migraine, but it also seems to be predictive of therapies, meaning things that suppress it are generally helpful as preventive treatments, whereas things that trigger it may be things that trigger migraines."

Dr. Charles notes there is a complex, bi-directional relationship between migraine and sleep, but the basic mechanisms are poorly understood. On one hand, he says, an attack often can lead people to go to sleep, partly because sleep can be beneficial to migraine. Conversely, chronic migraine wreaks havoc with the sleep-wake cycle, so the normal sleep rhythm is disrupted, which also can trigger migraine.

> "If you sleep too little or too much, that's commonly identified as a migraine trigger."

"So, if you sleep too little or too much, that's commonly identified as a migraine trigger," says Dr. Charles, who also is a member of the UCLA Brain Research Institute. "For those with frequent migraine, it becomes a vicious cycle where the migraine causes sleep disruption, which then turns around and further exacerbates the migraine."

Dr. Charles and other UCLA researchers have been studying the phenomenon of CSD for some time; however, in order to trigger and record it, typically the mouse had to be under anesthesia — an artificial situation that changes the interpretation of the results. To address that issue, two of Dr. Charles's colleagues, — Dmitri Yousef Yengej, PhD, and Guido Faas, PhD — developed a minimally invasive microchip system that monitors and records brain activity and behavior in freely behaving mice.

"Dr. Yousef Yengej describes it as a Fitbit for mice," Dr. Charles says. "We're recording different kinds of parameters like brain blood flow, head movement and multiple other physiological and behavioral parameters in freely behaving mice over weeks."

In addition, Dr. Yousef Yengej and Dr. Faas built a light trigger in the microchip system that activates cellular channels in mice called channelrhodopsin, a technique widely used in neuroscience to turn a specific cell on or off by shining light on it. "When the mice are expressing this channelrhodopsin in specific cells, we can trigger this phenomenon of CSD through the intact skull of an awake or asleep, freely behaving mouse. The same chip that's doing the recording of brain blood flow and movement can also trigger brain activity — in this case, cortical spreading depression," Dr. Charles says.

The goal is to apply what the researchers have learned about mice and sleep to humans, he says, which could have implications for preemptively treating migraine as well as understanding why migraine is more common, easier to trigger, harder to treat and more significant during sleep.

In addition to understanding the relationship between sleep and migraine, Dr. Charles calls the technology an "enormous breakthrough for all kinds of research." For example, he says, the technology could be applied to study sleep disorders, pain disorders and, potentially, even brain disorders such as Alzheimer's disease.

— Jennifer Karmarker

"Different Characteristics of Cortical Spreading Depression in the Sleep and Wake State," *Headache,* April 25, 2022

AN OUNCE OF PREVENTION

As the new chair of the U.S. Preventive Services Task Force, Dr. Carol Mangione leads a national effort to promote evidence-based preventive care and mitigate systemic racism in the development and implementation of preventive services.

Carol Mangione, MD

Barbara A. Levey M.D. and Gerald S. Levey, M.D., Endowed Chair in Medicine

Chief, UCLA Division of General Internal Medicine and Health Services Research

Chair, U.S. Preventive Services Task Force

Carol Mangione, MD, has a new title to add to her already crowded business card: chair of the U.S. Preventive Services Task Force (USPSTF). Created in 1984, the USPSTF is an independent, volunteer panel of national experts in prevention and evidence-based medicine that makes evidence-based recommendations on clinical services such as preventive screenings, counseling and use of medications aimed at preventing illness. Dr. Mangione, whose other titles include Distinguished Professor of Medicne in the David Geffen School of Medicine and Distinguished Professor of Public Health in the UCLA Fielding School of Public Health, as well as director of the UCLA Resource Center for Minority Aging Research, has been a member of the preventive services panel since 2016 and was vice chair from 2020 to 2022. She spoke with Enrique Rivero, senior media relations officer for UCLA Health, about her new role, lessons learned from the COVID-19 pandemic and dealing with the glut of misinformation that is choking the national dialogue about scientific and medical issues.

JESSICA PONS

Let's jump right in with the hard stuff. How do we break through the noise of disinformation to disseminate and create acceptance for accurate, evidence-based scientific and health-related information?

Dr. Carol Mangione: This is a huge problem right now. With the proliferation of social media and the internet, it's very hard for the public to sort through all the uncurated information that is out there. Transparency is essential, and the task force has a long history of publishing our methods on our website for anyone to read. If we are addressing a new topic, we post our research plans on the website for public comment, read and give consideration to every comment we receive, and then we post the final research plan and our draft recommendations before we publish them. Part of why the task force is so trusted is because we have always employed rigorous, transparent, evidence-based methods to develop our recommendations. To grade a recommendation, the key metric we use is net benefit for the patient. We always are balancing benefit against harm. No service comes without both sides, so we have to have moderate-to-high net benefit to be able to give an A-grade or B-grade recommendation. When we find that there is no net benefit or there is potential harm from a given service, we will give that recommendation a D-grade, and we use an I-grade when there is insufficient evidence for or against the use of a preventive service.

"I think what we really have learned is that access to care and services is fragile."

What lessons have we learned over the course of the pandemic?

Dr. Mangione: I think what we really have learned is that access to care and services is fragile. When the pandemic happened and all of a sudden there were a lot of new rules and policies to try to reduce transmission of COVID-19, combined with people's fears about coming to health care facilities, we saw a dramatic decrease in access to care. People were making a judgment call about whether or not it was safe to come in for a service, such as colonoscopy to screen for colorectal cancer, or if it was best to postpone the screening. It is well-documented that many people in the U.S. missed out on a lot of services, and now we're really playing catch-up. There is a little bit of a silver lining in how health care systems across the country addressed the access problem, UCLA included, by pivoting quickly to virtual visits. Not every patient service requires an in-person visit, so a lot of preventive services, like counseling for smoking cessation, can be done just as well with a virtual visit. Telemedicine has opened up another way to deliver services. Patients often times prefer it, and I don't think there's any going back.

In your role as chair of the task force, what do you see as the most significant challenges facing us on the national level?

Dr. Mangione: Access to care continues to be the biggest challenge for use of preventive services. For example, when we look at national population-based data such as the cancer-registry data, who gets cervical cancer? For the most part, patients who have never been screened. Who are these patients who have never been screened? They tend to be among the low-income population and from rural communities. They also are more likely to be Native Americans or Black persons. All of these social, ethnic and racial factors affect access to potentially life-saving screening. So, here we are with a test that can detect cervical cancer early and prevent deaths from cervical cancer, and yet, during the last four decades we can't seem to get it into the hands of all those who are eligible for screening in our country. To me, that's the biggest problem we face.

What can the task force do?

Dr. Mangione: Every year we report to Congress about critical evidence gaps that are driving disparities in health care and worsening the health of people in the U.S. Continuing to raise these issues for the people who fund medical research in this country is very important. Partnering with organizations that advocate for some of the highest-risk groups in the country is also very important. Representatives from these groups come to our meetings and observe our processes, and when our recommendations go out for public comment, they will make comments and pick up on things that we might have missed or need to emphasize. And we've been very focused on making sure there is broad racial, ethnic, gender and geographic representation on the task force. Having broad representation that includes racially and ethnically diverse clinicians and clinicians from all regions of the United States means that we have people at the table who are thinking about populations that have the most adverse health outcomes from conditions that we screen for. We need more of a national approach that recognizes this problem and puts the resources in the right place to really begin to address universal access to preventive services.

What about mitigation of systemic racism in the development and implementation of preventive services?

Dr. Mangione: The task force has published proposed actions to address these issues. Among them are careful consideration of opportunities to reduce health inequities when selecting new preventive-care topics and prioritizing current topics; purposefully seeking evidence about the effects of systemic racism, health inequities in all research plans and requested public comments and integrating available evidence into evidence reviews; and summarizing the likely effects of systemic racism and health inequities on clinical preventive services in USPSTF recommendations. The USPSTF will pilot test the implementation of these actions on USPSTF topics that hold the most promise for mitigating health disparities.

What is your most urgent concern right now?

Dr. Mangione: The disproportionate underuse of services among people who have the highest prevalence of medical conditions and the worst health outcomes. If we are going to move the needle for health in this country, we're going to have to address this. COVID-19 was a terrible thing, and it has killed more than a million Americans. But if we look at the actual numbers, what we see is that the loss of life was the highest among Latino people. It was also very high among Black people. This is unacceptable. The virus isn't selective. It is not choosing which populations to strike hardest. Something else in our society is driving this. If we had fair and equal access to resources, I don't think we would see a differential in who dies from breast cancer or who dies from cervical cancer or who dies from prostate cancer, so, it isn't all just about screening. Even if we fix the prevention problem completely, we still have to have the systems in place to deliver evidence-based treatments to the people who are diagnosed with serious conditions.

What is your greatest hope?

Dr. Mangione: My greatest hope is that we get the right services to the right people at the right time. But it is important to understand that the task force never considers coverage decisions. For us, it's all about health benefit balanced against harms and coming up with evidence-based recommendations that, I would say, are completely insurance-coverage and cost agnostic. When the Affordable Care Act passed, the legislation said that for people with private or commercial insurance, all Grade A and Grade B recommendations have to be covered with no patient cost sharing; that's a huge step in the right direction. But the task force has no regulatory or decision-making power that influences who ends up insured in this country and who has access to services.

The task force's recommendations have not been without controversy.

Dr. Mangione: That is true. Since our last breast-cancer screening recommendation came out in 2016, there's been a long-running controversy about the value of screening annually versus every two years. There has also been controversy about whether to start screening at age 40, at age 45 or at age 50. Some professional organizations have recommendations with earlier starting ages and greater frequency of screening. In 2016, the task force looked very carefully at the evidence and the marginal benefit of screening every two years versus every year in average-risk women and concluded that the benefit of annual versus biennial was so small

"My greatest hope is that we get the right services to the right people at the right time."

JESSICA PONS

that we ended up recommending screening every two years. Some groups felt strongly that that was a big problem and push for screening that is more frequent for higher risk groups like Black persons. The task force takes this concern very seriously and will continue to carefully examine the evidence that supports specific screening intervals. If we were to see evidence that shows that the benefit of starting a preventive service at a younger age or using it more frequently outweighs the harms in one group versus another, then these findings would support the development of groups-specific recommendations. But, unfortunately, this evidence from well-designed studies is often times very hard to come by.

What role can the task force play in increasing access to care?

Dr. Mangione: I think the biggest role we can play is to point out the problem to the people who pay for research and pay for health care in our country. Our reports to Congress often focus on disparities in access to care and outcomes. Our recommendations fall into three categories: screening tests, preventive medications for conditions like high cholesterol and short behavioral interventions that can either be delivered in primary care or referred from primary care, such as brief interventions to reduce unhealthy alcohol use. We feel strongly that for the health of the nation, people should have access to these screenings and treatments, and our role can be to communicate this to the public and to make it clear in our recommendations where there are challenges for implementation. We also have a section in our recommendations called "clinical considerations" — often that is where we will talk about access issues — and a section on research gaps, which often focuses on equity issues with health care delivery. With our national platform, the task force is in a position to talk to legislators, to talk to people who fund research, to people who fund clinical care, and to point out to them these big problems that need to be addressed if we are to improve the health of all Americans. ●

DR. "TAYO" IKOTUN

STEPS INTO THE *U* MAGAZINE SPOTLIGHT

ALEXIS EKE

As head of the Laboratory for Image Guided Immunotherapy, Olulwatayo "Tayo" Ikotun, PhD, assistant professor of molecular and medical pharmacology and a member of the Crump Institute for Molecular Imaging, uses nuclear imaging to better understand how the immune system responds to the onset of disease and therapeutic interventions. She hopes that the knowledge gleaned from her studies will lead to the design of therapeutics that can be precisely tailored to address the unmet needs of the 60-to-70% of patients who remain unresponsive to current cancer immunotherapies.

WHEN DID YOU FIRST START TO THINK ABOUT SCIENCE?

My parents are immigrants, and in my house you could either be a doctor, a lawyer or an engineer. My grandfather was a physician, and I admired him and wanted to follow in his footsteps. When I went to college, I discovered I really like chemistry. Professor Robert LaDuca let me into his chemistry lab when I was an undergraduate at Kings College, and that is where I started doing actual science.

WHAT WAS YOUR FIRST EXPERIMENT?

I was a late bloomer. My first real experiments were in general chemistry labs, mixing an acid and a base together and measuring the pH, making soap, doing titrations, that sort of thing. It was pretty rudimentary, but I always enjoyed seeing the color changes — cooper going from blue to green, for example. I thought that was cool. I like colors.

WHAT HAS BEEN THE GREATEST CHALLENGE IN YOUR WORK?

Assay development. I think that's the bane of most people working in laboratory science. It can take a lot of time, and it can be very frustrating because it's test, change a variable, repeat, change another variable, repeat. It's the hardest step, and it is possible while you're trying to get it right to lose faith in the project. But once you have it, then it's smooth sailing. Just having the patience to do all of the right steps in the right order and not be sloppy and not jumping ahead, but sitting and doing that meticulous, often-tedious repetition, can be a challenge.

WHERE DOES YOUR INSPIRATION COME FROM?

From my parents. They sacrificed a lot for us; their children are their greatest source of pride. And my aunt passed away from a rare uterine cancer, and that, too, has been a big motivator to better understand the nature of cancer and help develop tools to detect when cancers go rogue.

WHO IS YOUR SCIENCE HERO?

As a graduate student, I admired P.J. Sadler, from the University of Warwick in Great Britain. I met him in person at a conference, and he was the nicest, most approachable human being, and it showed me that you can do great science and be really smart and well-published and still be a normal and super-approachable person who creates space for trainees to talk to you. Another science hero is now a colleague, Michael Phelps, and he is a big part of the reason I came to UCLA. He has always been very approachable and made himself available. Science is hard, but we're all still just human beings.

WHERE ARE YOU HAPPIEST?

I have good friends who are at the same level as me, or just a few years ahead, and when we get together, we talk about where the field is and what do we think about this or that and why something maybe isn't working. Having a safe space to explore what you're thinking, no matter how kooky, and seeing if you can convince people who are comfortable telling you that your idea is dumb because of this, or is great because of that, is really inspiring.

WHAT DO YOU CONSIDER TO BE YOUR FINEST ACHIEVEMENT?

I'm still waiting on that. I feel like I'm still a baby scientist, just starting to figure out my place in the scientific world.

WHAT IS YOUR GREATEST VIRTUE?

I think that I am empathetic. I try to understand where people are at. I think that empathy also carries over into vigilance; we have to keep the patients and their families who are looking to us to help them at the forefront of our minds when we are at the bench.

WHAT IS YOUR GREATEST FAULT?

I'm very direct, and I recognize that can be off-putting, and that maybe that can make students feel like I'm not on their side. But that is not the case at all; I am 100% committed to their learning and success. I feel clarity and directness are important for science and their training.

WHAT IS YOUR MOTTO?

"The only failure is failure to learn." Also, one that I live by is, "If you're not learning, then you better be dying." That one came from my PhD advisor.

WHOM DO YOU MOST ADMIRE?

My mom. Life has thrown her so many curves, and she just gets on with it. She put that into raising us and taught us to pull ourselves up and keep it moving. Professionally, my PhD advisor at Syracuse University, Robert Doyle. He was tough on us so that we would be good scientists, but he's always been there for us and still makes himself available — a mentor for life. Ann-Marie Chacko, a colleague at Duke-NUS Medical School in Singapore, also is someone who always inspires me. She's like a shot of Red Bull for me.

IF NOT A SCIENTIST, WHAT WOULD YOU BE?

Maybe I would have gone into acting or stand-up comedy. I was really into performance arts when I was younger — member of the drama club, acting in school plays, being in an acting troupe. My brother thinks I should try an open-mic night. Maybe I will.

WHAT IS YOUR MOST TREASURED POSSESSION?

My dog, Milo. He is a real emotional support for me. Rough day at work? He's right there to be a bud. Long nights in the lab? He's up for that, too. He's a Bernese mountain dog-poodle mix and is the sweetest dog ever.

TO WHICH SUPERHERO DO YOU MOST RELATE?

My favorite is Rogue, from the X-Men. She's always the pinch hitter, and even though she's not the leader, she is the strongest. I think I relate to that because in life, I'm generally the pinch hitter, the one my friends call in an emergency and things like that.

WHAT KEEPS YOU UP AT NIGHT?

Worrying that I won't contribute anything insightful to the field, that I won't be the mentor that my students need — not the one they want, but the one they need — and that we won't get funding.

WHAT IS THE BEST MOMENT OF YOUR DAY?

When I see a student get it. It's like seeing a scientist being born and is the most rewarding thing.

HOW DO YOU HOPE TO CHANGE THE WORLD?

I'd like to help deliver something that actually gets implemented in the clinical setting to benefit patients. And also, I really want to have inspired the next generation of scientists in some way, whether it's for them to have someone who believed in them before they believed in themselves, or for them to have someone who will advocate for them and push them toward achieving their scientific dreams. Ultimately, I hope that my students will be better than I am.

WHAT IS YOUR DEFINITION OF HAPPINESS?

Being content with the things around you, having the grace to accept the things you cannot change, being lucky enough to do what you feel you were put on this earth to do and finding people who see that passion and excitement in you and who celebrate it with you and inspire you to be better.

WHAT IS YOUR DEFINITION OF MISERY?

Being extraordinarily ordinary. Not being challenged or working at my fullest potential. Misery would be just existing, getting up and not doing something that really excites me, that makes me feel vibrant or passionate or alive.

WHAT MUSIC DO YOU LISTEN TO WHILE YOU WORK?

When I was spending a lot of time in the lab, it would be '90s hip-hop, but now that I spend more time pondering and writing, I've started listening to Lo-Fi beats. It's very Zen. It's just something in the background that keeps me moving but doesn't distract me. But when I'm in the lab pipetting, it's '90s hip-hop, R&B and pop. ●

Solving Sickle Cell

Investigators at UCLA are at the forefront of research to cure this painful, debilitating and often-deadly blood disorder.

By Kenneth Miller

ADAM AMENGUAL

Dr. Donald B. Kohn: “It’s too soon to use the ‘c’ word, to say there’s a cure. But things are looking very promising.”

If you'd met Evie Junior three years ago, you never would have guessed that his own blood was gradually killing him. At 27 years old, he was tall and muscular, capable of bench-pressing 300 pounds. He pulled long hours as an emergency medical technician, hoisting patients into an ambulance with ease. For most of his life, however, an insidious ailment had been sapping his strength and sending him into paroxysms of pain.

Junior was struggling with sickle cell disease, an inherited disorder marked by defective hemoglobin — the protein in red blood cells that carries oxygen throughout the body. Cells with sickle hemoglobin are stiff, sticky and crescent-shaped. They often clump together, blocking small blood vessels. These snags cause agonizing episodes known as pain crises, centered on the limbs, back or chest. The reduction of blood flow can damage bones, skin and vital organs. Because sickle cells live for only days, compared to months for normal red blood cells, people with the disorder are prone to anemia, with symptoms including fatigue, dizziness and shortness of breath. They're also vulnerable to stroke, vision loss, lung troubles and infections.

These miseries arise from a defect in a single gene — a mutation most common in people of African ancestry, though it's also found among several other ethnic groups. People who inherit the glitch from one parent usually have no symptoms. People with copies from both parents may start out with mild illness, but their suffering typically worsens with age. Among the 100,000 patients with sickle cell disease in the United States, median life expectancy is in the 40s.

Growing up in the Bronx, New York, Junior — who is Black and Puerto Rican — faced challenges beyond the poverty endemic to his tough neighborhood. When he was a toddler, his mother would sometimes find him curled on the floor crying, unable to walk. At 3 years old, he had his spleen removed; at 16, his gallbladder. In high school, he was a fierce competitor on the basketball court and the gridiron, but he was dropped from the football team when a pain crisis made him miss tryouts. Though he was smart and intellectually curious, college was out of the question. "I couldn't enroll in a class and then go to the hospital for three days," he explains.

Junior did his best to stay well — eating right, exercising devoutly — and took on physically demanding jobs despite his illness. After graduating high school, he worked as a personal trainer, then moved to Portland, Oregon, where he became an EMT. But the pain crises began striking more frequently, often sending him to the emergency room. He was hospitalized with

THE MORRISONS

Evie Junior: "I was willing to risk it all. Nothing could be worse than just sitting here and dying slowly."

pericarditis, an inflammation of the thin, saclike tissue surrounding the heart. He developed patches of dying bone tissue in both legs.

Aside from painkillers, few effective treatments are available for sickle cell disease. Four medications have been approved by the Food and Drug Administration (FDA); although they can ease symptoms for some patients, they can also cause troublesome side effects. A bone-marrow transplant from a sibling can eliminate the disorder, but fewer than 20% of patients have a brother or sister who is an eligible match.

Junior tried two of the medications. The first made him tired and breathless, and the second did nothing whatsoever. The others, at thousands of dollars per month, were financially out of reach. His doctor referred him to a hematologist, who suggested he look into a transplant. Junior's sister agreed to be tested as a possible donor, but she proved to be incompatible. His only remaining option, the specialist said, was an experimental treatment: stem-cell gene therapy, in which his blood stem cells would be genetically modified to produce non-sickling hemoglobin. But no one could be sure that it would help him, she warned, and there was a chance that it would do him harm.

"I told her I was willing to risk it all," Junior recalls. "Nothing could be worse than just sitting here and dying slowly." He asked where the nearest clinical trial was being conducted. That's how he found himself at UCLA.

THE TRIAL THAT JUNIOR JOINED IN JULY 2019 IS ONE OF SEVERAL SICKLE CELL STUDIES currently ongoing or planned at the Eli and Edythe Broad Center of Regenerative Medicine and Stem Cell Research at UCLA. It's also part of a larger group of studies, at academic centers and biotech companies in several countries, whose preliminary findings offer hope that a cure for sickle cell disease is close.

In the past five years or so, dozens of participants in these trials have found lasting reprieves from their pain and other complications from a single infusion of genetically modified stem cells. There have been setbacks, too, and the durability of the positive results remains to be seen. Still, the mood in the field is judiciously upbeat. "It's too soon to use the 'c' word, to say there's a cure," says Donald B. Kohn, MD, Distinguished Professor of Microbiology, Immunology & Molecular Genetics, and professor of pediatric hematology-oncology. "But things are looking very promising."

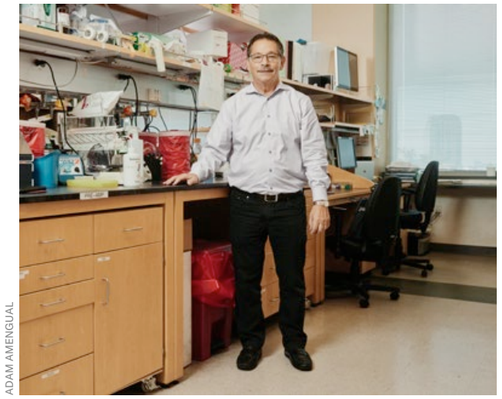
What makes the recent breakthroughs all the more remarkable is that research on gene therapy for sickle cell began far later than for many other conditions. In part, this reflects the perennial shortage of funding for maladies that mostly affect people of color in low-income parts of the world. But the slow start also stems from the nature of this disease.

"It's a hard target," observes Dr. Kohn, who serves as medical director of the UCLA Human Gene and Cell Therapy Program — and who'd spent two decades devising gene therapies for other deadly ailments by the time he tackled sickle cell. To understand what it took for scientists to turn the tables on this formidable adversary, it helps to start with his story.

DR. KOHN DISCOVERED HIS CALLING DURING HIS FIRST YEAR OF MEDICAL SCHOOL at the University of Wisconsin, when he heard a lecture by Richard Hong, MD, who'd recently performed the first bone-marrow transplants on children with severe combined immunodeficiency (SCID), or "bubble baby syndrome" — a genetic disorder that left them without a functioning immune system. He went on to do his pediatric residency with Dr. Hong, followed by a fellowship at the National Institutes of Health (NIH) under immunologist R. Michael Blaese, MD, who was helping to develop the earliest gene therapy for SCID.

In 1987, Dr. Kohn became an attending physician in the bone-marrow transplantation program at Children's Hospital Los Angeles. But in his own research, he would focus on gene therapy as an alternative to such transplants for a wide range of ills. Eventually, he became director not only of bone-marrow transplantation, but also of the hospital's research-immunology and gene-therapy programs, a sign of both his multidisciplinary expertise and the interconnectedness of the three fields.

From early on, Dr. Kohn recognized that bone-marrow transplants — though they can be life-saving for patients with disorders ranging from immunodeficiencies to blood cancers to hemoglobinopathies — have serious drawbacks. The need to find a compatible donor is just one of them. "I've probably done 500 of these procedures, and every one of them is scary," he says. "You're taking someone to the edge of a cliff, handing them a parachute and hoping it opens before they hit the ground."



ADAM AMENGUAL

Dr. Kohn: "I've probably done 500 of these procedures, and every one of them is scary. You're taking someone to the edge of a cliff, handing them a parachute and hoping it opens before they hit the ground."

Before the transplant, chemotherapy is used to suppress the immune system and make room in the patient's own marrow for the transplant. This is a harrowing process that is sometimes fatal. If all goes well, the patient then receives blood stem cells from the donor; these go on to make new marrow, which produces healthy blood cells. Further dangers loom, however.

Expanding Care to Extend Lives

By Courtney Perkes

When E. Dale Abel, MD, PhD, chair of the Department of Medicine in the David Geffen School of Medicine at UCLA and executive medical director of the UCLA Health Department of Medicine, looks at the incidence of sickle cell disease and how patients are treated, he sees a gloomy portrait of unequal care that is "spotty at best, and very fragmented."

"We live in a city that has significant health care disparities, and this is exemplified by sickle cell disease, which primarily affects people of color," he says.

To address this problem, UCLA Health launched a new center in September with the goal of improving quality of care and increasing life expectancies for patients with sickle cell disease. In addition to primary and preventive care, and early management for complications, the center provides access to specialty care that often is lacking for patients with the disease, which can affect multiple systems in the body.

"There's hardly an organ system that's not affected by the sickle process," says Gary J. Schiller, MD (RES '87, FEL '90), a hematologist and director of the Bone Marrow/Stem Cell Transplant Program.

As Dr. Abel notes, access to appropriate health care resources is a significant problem for patients with sickle cell disease, an assertion that is supported by organizations such as the CDC Foundation, an independent nonprofit that works closely with the Centers for Disease Control and Prevention. The foundation reports there are a limited number of physicians who are trained and willing to treat adult patients with sickle cell disease. And because most patients with sickle cell disease are covered by Medicaid rather than private insurance, fewer doctors accept their government insurance.

> "IT WILL PROBABLY TAKE A NUMBER OF YEARS FOR US TO REALLY TURN AROUND THE STATISTICS IN THIS COMMUNITY, BUT IT IS WORTH EVERY BIT OF EFFORT AND EVERY PENNY OF INVESTMENT WE ARE PUTTING INTO THIS."

In addition, people with sickle cell disease may be inaccurately perceived as drug seekers, and they often face longer waits to see a doctor or receive pain medication when visiting an emergency department, according to the foundation.

Disparities are also reflected in shorter life spans. Nationwide, the median life expectancy for a person with sickle cell disease is 42-to-47 years. In addition, Californians with sickle cell disease have higher rates of emergency department visits and hospitalizations than those in other states. "We don't do a good job of taking care of patients with sickle cell in California," Dr. Schiller says. "We don't really have adult-focused programs."

Dr. Abel is hopeful that UCLA will be able to improve lifespans through accessible, high-quality primary care. It has been clearly demonstrated that disease-specific centers such as the new UCLA Health sickle cell disease center can reduce complications, emergency department visits and hospitalizations. "Anything that has to be built literally from the ground up will take some time to affect all of the lives that need to be touched," he says. "It will probably take a number of years for us to really turn around the statistics in this community, but it is worth every bit of effort and every penny of investment we are putting into this."

In 2019, California allocated $15 million in state funds over three years to establish new sickle cell disease centers to provide cost-effective, coordinated care. The effort is overseen by the Networking California for Sickle Cell Care Initiative (NCSCC), which was launched by the Center for Inherited Blood Disorders and the Sickle Cell Disease Foundation.

Los Angeles County has the largest number of people with sickle cell disease in the state. "There's probably about 2,500 adults with sickle cell disease in L.A. County, and most of them do not have primary care or access to a hematologist," says Alice Kuo, MD '96 (FEL '03), PhD '02, who is working with Dr. Schiller to launch the center.

Patients receiving care at the center are able to receive fluid hydration, pain management, social support and other care seven days a week. Intravenous fluids to prevent dehydration can stop the sickling process and prevent severe pain that can lead to emergency department visits. Patients also have access to clinical trials, which include medications for treatment and gene editing that has potential to offer a cure for sickle cell disease in the coming years.

"The new program attempts to create the same kind of comprehensive center that exists for hemophilia or cystic fibrosis," Dr. Schiller says. "These kinds of centers in the community have been shown to significantly decrease emergency room visits, hospitalizations and length of stay."

Dr. Kuo believes that in the coming years, UCLA will be caring for most adults with sickle cell disease in the region. "My goal is not just to increase the life expectancy of patients, but also to increase their quality of life," Dr. Kuo says. "I hope that by giving them access to high-quality primary care, we will take care of their medical condition and get them on the right path to learning how to manage their condition, so they can then live their lives to the fullest."

***Courtney Perkes** is a freelance writer specializing in health care issues.*

The patient must take immunosuppressant drugs to prevent rejection, raising the risk of infections and malignancies. The transplanted marrow can attack the patient's tissues, a reaction known as graft-versus-host disease. Or the patient's refurbished immune system can malfunction, failing to guard against microbial intruders.

Gene therapy strives to avoid these downsides by using cells harvested from the patient's own body. These are genetically modified to combat a specific disease, then returned to the patient in a so-called "autologous" transplant. The process was first completed successfully in 1990, in a 4-year-old girl with a form of immunodeficiency known as ADA-SCID. An NIH team made the breakthrough, using a tool that Dr. Kohn had worked on during his fellowship: a retroviral vector.

A vector is the technical term for a carrier that delivers new genetic information into target cells. Viruses are well-suited for this purpose, because they reproduce by reprogramming a cell's DNA. And retroviruses, which carry their genetic material in the form of RNA, have an added advantage: Unlike some of their viral kin, they can integrate their genes into a host's chromosomal DNA, ensuring that the changes are preserved as cells reproduce.

The mutation that causes ADA-SCID occurs in the ADA gene, which enables the body to produce an enzyme crucial to the growth of T- and B-lymphocytes — white blood cells that function as the foot soldiers of the immune system. Without this enzyme, stem cells that give rise to the lymphocytes die before they mature. To fix the problem, the researchers made a vector based on a mouse leukemia retrovirus. After removing the virus's disease-causing RNA, they used genetic engineering to load it with a corrected version of the ADA gene.

Next, the NIH team collected T-lymphocytes from the girl, who was taking medication that enabled them to grow to maturity. After culturing large numbers in the lab, the team infected the cells with the modified retrovirus. Finally, the researchers infused the infected T-cells — now carrying the corrected gene — back into the patient.

The girl's immunodeficiency improved markedly, and she was able to enroll in school and live a normal life. But her lymphocyte counts fluctuated, and she needed continuing treatments to remain healthy. Among the lessons that researchers learned from this experiment was that gene therapy for blood disorders had to be aimed at stem cells to have maximum effect. This is because blood stem cells can self-renew and produce all kinds of blood and immune cells, which means that genetically corrected blood stem cells should be able to persist and produce healthy cells throughout a patient's life.

While the NIH researchers were delivering the first gene therapy for ADA-SCID, Dr. Kohn and his lab at Children's Hospital branched out to other diseases — mainly HIV and blood cancers — while developing new methods for culturing stem cells and creating viral vectors. Like many other gene-therapy researchers, he was eager to try such approaches on sickle cell disease, as well. But there were two major obstacles: First, judging by the results of bone-marrow transplants, controlling sickle cell symptoms would require correcting 20-to-50% of a patient's blood stem cells, versus just 5% in SCID. "We needed to get better at transferring genes into the stem cells," Dr. Kohn explains.

The second hurdle to tackling sickle cell disease was that the mutation that caused it was dauntingly complex. Unlike the defect in the ADA gene, which prevented cells from producing a necessary enzyme, the sickle cell mutation instructed cells to make an abnormal protein. "We had to find some way to counter it," says Dr. Kohn. "The technology wasn't there yet."

BY THE EARLY 2000s, GENE-THERAPY TECHNIQUES FOR BLOOD DISORDERS HAD MADE BIG STRIDES. After a handful of patients developed leukemia in clinical trials using retroviruses, many researchers switched to lentiviruses (a group of slower-acting retroviruses, such as HIV), which are less likely to integrate with the genome in locations that can cause cancer. Scientists had learned that treating patients with chemotherapy before giving autologous transplants created space for the corrected cells, though the dose could be lower than with conventional, or allogenic, transplants.

Meanwhile, other researchers had gained crucial insights into sickle cell disease —particularly, the role of fetal hemoglobin in the disorder's progression. It had long been known that the structure of hemoglobin changes with age. In human fetuses, the four-part protein consists of two alpha units and two gamma units; a few months after birth, production of gamma mostly stops, and blood cells begin producing beta instead. The sickle cell mutation affects only the beta unit. In 1994, a study showed that patients whose hemoglobin was more than 8.6% gamma had milder symptoms and survived longer than those with lower levels.

ADAM AMENGUAL

Dr. Gary J. Schiller (Left): "I've been harping about sickle cell for more than 30 years on the faculty. I've seen how patients suffer with this disease — and not only with the symptoms. So many of these individuals are medically under-resourced."

Dr. Theodore B. Moore (Right): "The quality of life is so much better with gene therapy. We have a saying: The best transplant is one you never have to do."

Soon afterward, teams at UC Berkeley and the University of Alabama found a way to model the persistence of gamma-globin in genetically engineered mice, and to switch production on and off. The stage was set for scientists to begin investigating how fetal hemoglobin modified disease symptoms, and whether similar effects could be obtained through gene therapy. A few researchers at other institutions began doing just that.

What emboldened Dr. Kohn to attack the sickle cell conundrum was the advent of the California Institute for Regenerative Medicine (CIRM). Created in 2004 by a state ballot initiative, the institute authorized $3 billion in funding for stem-cell research, with the goal of accelerating treatment for patients with unmet medical needs. Dr. Kohn was among the first scientist to be awarded a grant to study sickle cell disease, and CIRM has supported his research on the topic since 2008. The following year, he joined the faculty at UCLA.

Dr. Kohn began his work on sickle cell with preclinical studies, adapting some of the methods he and others had developed for disorders such as ADA-SCID and leukemia and testing them in cell cultures. In 2013, a Massachusetts company called Bluebird Bio launched the first human trial of a gene therapy for the disease, beating him to the punch. But the early success of that trial, in which nearly all patients experienced relief from their symptoms, was encouraging news. At this stage of the game, there was plenty of room for exploration and innovation.

Like Bluebird Bio, Dr. Kohn launched a clinical trial that used a lentiviral vector to deliver a different gene meant to inhibit sickling. His research has expanded outward from there. Dr. Kohn also has developed, in collaboration with researchers at UC Berkeley and UC San Francisco, an approach employing the gene-editing tool known as CRISPR Cas-9 to correct the sickling mutation in the hemoglobin gene. Yet another method combines two different anti-sickling genes developed by Dr. Kohn and pediatric hematologist-oncologist David A. Williams, MD, of Boston Children's Hospital. In addition, Dr. Kohn is principal investigator on a grant submitted to CIRM to develop a more affordable gene therapy for sickle cell disease, based on a small vector dubbed Mini-G. Designed by a project scientist in his lab, Roger Hollis, PhD,

and Richard Morgan, MD ’21, PhD ’21, who was then a fourth-year medical student in the UCLA-Caltech Medical Scientist Training Program, the vector can be produced in larger quantities, and get into stem cells more efficiently, reducing costs.

Theodore B. Moore, MD (RES ’92, FEL ’95), chief of pediatric hematology-oncology and director of the Bone Marrow Transplant Program at UCLA, is another UCLA researcher at the forefront of investigation into a cure for sickle cell disease. He and hematology-oncology fellow Shanna White, MD, are engaged in a clinical trial testing a gene therapy designed by Dr. Williams to prevent sickling by jamming a molecular “switch” that normally turns off fetal hemoglobin production in the first months of life. All these diverse methods are intended as better alternatives to bone-marrow transplants for patients with sickle cell disease who don’t have a viable donor, or who are too high-risk to be candidates for that grueling procedure. Researchers also envision them as eventual options even for those who could have a transplant from a donor, but prefer to avoid the dangers of rejection and the need to take immunosuppressants. “The quality of life is so much better with gene therapy,” Dr. Moore says. “We have a saying: The best transplant is one you never have to do.”

DR. KOHN STARTED HIS CLINICAL TRIAL OF THE LENTIVIRAL VECTOR in December 2014, partnering with Gary J. Schiller, MD (RES ’87, FEL ’90), professor of medicine and director of the Bone Marrow/Stem Cell Transplant Program at the David Geffen School of Medicine at UCLA. “It’s a natural fit,” Dr. Schiller says. “I’ve been harping about sickle cell for more than 30 years on the faculty. I’ve seen how patients suffer with this disease — and not only with the symptoms. So many of these individuals are medically under-resourced. During a pain crisis, they end up in the ER, where they’re often accused of drug-seeking behavior.”

THE MORRISONS

“My partner and I have been talking about kids. When I was dealing with sickle cell, that was a topic I didn’t feel comfortable discussing,” says Evie Junior, with his girlfriend, Danielle.

The idea was to start with a small clinical trial testing the therapy’s safety and efficacy on a total of six young adults with severe disease. Their first patient treated was not a success. Collecting enough of her stem cells proved unexpectedly difficult. After the cells were exposed to the vector and returned to her bone marrow, it turned out that few contained the corrected gene. Her symptoms failed to improve, and, sadly, she died of sickle cell complications in 2017.

The team spent a year retooling. “We learned where we were on the map,” Dr. Kohn said in an article published in the *Los Angeles Times* about the trial. “We were in the middle of the ocean. Now we’re on dry land.”

Instead of harvesting bone marrow surgically, they decided to use medication that drives stem cells into the bloodstream. They’d also give the next patient blood transfusions before starting chemo, to improve the stem cells’ health and reduce inflammation in the bone marrow. And they would switch to a smaller vector, manufactured by a lab in Italy, that could be inserted more easily into target cells.

Meanwhile, Dr. Kohn scored a significant victory over the disease that launched his career: In a trial of his gene therapy for ADA-SCID, developed in collaboration with Claire Booth, MD, at Great Ormond Street Hospital in London, immune function was restored in 48 out of 50 pediatric patients.

Patient number two in the UCLA sickle cell trial was Evie Junior. He enrolled in July 2019, after relocating to Los Angeles with his girlfriend — an audiologist he’d met on the job in Portland. As with the study’s previous participant, things moved slowly. Junior met with Dr. Kohn and Dr. Schiller, who explained the purpose and protocol of the study, outlined the risks, and sent him home with an informed-consent form to consider participation in the research. “He was kind of the ideal patient,” Dr. Schiller recalls. “Very knowledgeable, very strong. We could tell he was going to adhere to the program so that we could analyze what would happen.” Once Junior signed the papers, he underwent a month of tests: lung function, heart function, kidney function. He had an MRI to check his iron levels. He underwent a bone-marrow biopsy to make sure his bone marrow was healthy enough to yield a good number of stem cells.

Then came two months of transfusions, followed by three stem-cell-collection sessions. Junior’s stem cells were cultured, treated with the vector and frozen for storage. Between procedures, he worked for a private ambulance company.

Then, in early 2020, COVID-19 hit. For several months, the preparation process shut down. “I was feeling a little defeated at that point,” Junior recalls. “In July, they called and said, ‘Either we do this now or we’re gonna have to wait until the pandemic is over. Your choice.’ I was like, ‘I want to do this now.’”

Shortly thereafter, he checked into Ronald Reagan UCLA Medical Center, where a central venous line was placed in his chest and he spent four days receiving chemotherapy. The experience was grueling, with mouth sores, nausea and exhaustion that persisted over the next weeks. But the staff worked hard to keep him as comfortable as possible. “I felt like I had a team there supporting me,” he says.

When that was over, it was time for the transplant. His thawed bag of genetically corrected cells was hung on an IV pole and infused through his port. As the bag drained into his body, nurses gathered around and sang “Happy Birthday.”

Today, Junior is living in Seattle. It took him a few months to recover from the chemo, but he eventually felt strong enough to return to work. Fed up with the stress of ambulance riding, he trained as an electrician, and now makes his living upgrading residential systems and installing solar panels.

He hasn’t yet regained his athletic vigor, though he hopes to bring himself gradually back up to speed. Nonetheless, two years following treatment, he’s grateful for what he’s been able to leave behind: his pain crises. “I think it’s safe to say that chapter of my life is over,” he says. Which means, he adds, that new chapters can begin. “My partner and I have been talking about kids. When I was dealing with sickle cell, that was a topic I didn’t feel comfortable discussing.”

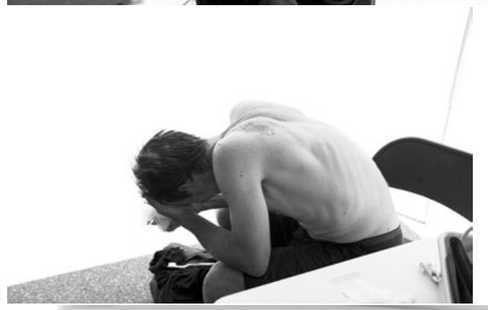
As for Dr. Kohn, he’s continuing the current trial and getting ready to start new ones. “I consider it an honor to do this work,” he says. “To see this degree of benefit is amazing every time.” ●

***Kenneth Miller** is a science writer and editor. His work has appeared in* Time, Discover, Mother Jones *and* Prevention, *among other publications. His latest book, scheduled to publish next year, chronicles the scientists who have pioneered the study of sleep.*

UCLA Health Care Collaborative team members provide services to "an under-resourced population that desperately needs care and attention." Pictured are (top right, from left) nurse Kendal M. Wilkie, social worker Selina M. Nuñez and social worker Brittany Jasker; (below and opposite page) Jasker; (middle left) Dr. Catherine M. Weaver; and (bottom) Wilke.

HOUSE CALLS

UCLA Health takes it to the streets to deliver care to people experiencing homelessness throughout Greater Los Angeles.



WITHOUT WALLS

By Jocelyn Apodaca Schlossberg
Photos by Ara Oshagan

On a Saturday afternoon this past spring at a neighborhood park in Santa Monica, a park "ambassador" approached Kendal M. Wilkie, RN, and told her about a man who appeared to be asleep on the cement floor of the restroom. He'd been there for nearly an hour, the ambassador said.

"WE ARE SEEING AN UNDER-RESOURCED POPULATION THAT DESPERATELY NEEDS CARE AND ATTENTION."

Wilkie and UCLA Health emergency department physician Natasha Wheaton, MD, who were in the park with a team of UCLA health care workers to deliver medical services to people experiencing homelessness, followed him to the restroom, where they found the man unconscious in a tiny, dimly lit cubicle. His inert body was blocking the door and had to be pushed aside to get it open.

The man, perhaps in his 50s and dressed in jeans and a polo shirt, wasn't sleeping; he had overdosed and was barely breathing. His skin was greyish, and he was cyanotic, his lips turning blue. What appeared to be drug paraphernalia was on the ground next to him.

"It was obvious," Wilkie says. "He was very much in need of urgent assistance."

Wilkie and her colleagues were at the park that day as part of the recently launched UCLA Health Homeless Healthcare Collaborative. They were getting ready to move on to their next stop when the ambassador approached.

While Dr. Wheaton stayed with the man and began maneuvers to stimulate his breathing, Wilkie ran back to their van to retrieve a dose of Narcan to reverse the effects of the overdose. A passerby in the park saw what was happening and called 9-1-1.

"He woke up a little bit when we gave him the Narcan. Luckily, the paramedics got there straightaway," Wilkie says. "They pulled him out of the bathroom and gave him another dose or two of Narcan, and he came fully around."

Wilkie believes that if the UCLA team had not been there, the ending to the man's story would have been tragically different. "Without intervention, he would have died," she says.

AS THE COVID-19 PANDEMIC REVEALED THE DEPTH OF HEALTH CARE DISPARITIES throughout the country, UCLA Health joined with community-health and social-service organizations to establish the UCLA Health Homeless Healthcare Collaborative. It started in January with a fleet of specially equipped vans to provide primary- and urgent-care services to street, shelter and interim-housing sites throughout the city. Services include preventive care, screenings, vaccinations, wound care, assessment and monitoring of chronic diseases, behavioral-health screenings, prescriptions, lab services and specialty-care referrals and coordination.

"We hope that by creating this durable structure to expand access to comprehensive, high-quality health care and social services we can play a significant role in improving the lives of so many people who too-often fall between the cracks," says Johnese Spisso, MPA, president of UCLA Health and CEO of the UCLA Hospital System. "At UCLA Health, we see firsthand the detrimental health consequences that can be brought on by homelessness. Providing quality care not only improves the overall health of people experiencing homelessness, it also improves their chances of receiving housing and employment opportunities."

For the UCLA health care workers like Wilkie and Dr. Wheaton staffing the vans, the work can resonate with deeper meaning.

"We are seeing an under-resourced population that desperately needs care and attention and who have been overlooked in the past," Wilkie says. "It brings up a lot of emotions, really. So many of these people have had bad experiences in the past with the health care system, and they are frightened and distrustful. Whatever we can do to make that a better, more positive experience for them is so important. We don't judge anyone. We come to where they live to care for them no matter what their need is."

California has the largest number of people experiencing homelessness in the country, an estimated 160,000. There are more than 66,000 unhoused people in Los Angeles County, with more than 41,200 in the Greater Los Angeles area. While data is yet to be released for the 2022 Greater Los Angeles homeless count, it is believed that the COVID-19 pandemic has caused an increase in the number of people experiencing homelessness due to unforeseen economic hardship.

"Our unhoused neighbors are still our neighbors," says Brian P. Zunner-Keating, RN, director of the UCLA Health Homeless Healthcare Collaborative. "They need to be treated with dignity and respect. In some ways, I wish our program didn't have to exist. I feel that health care is a human right, and we should be able to deliver efficient, effective, equitable care to everybody. But this is the reality in which we live."

Dr. Catherine M. Weaver (below) examines a patient, and she (upper right) and nurse Kendal M. Wilkie (lower right) attend to others during visits to area encampments.

A patient (top) waits to speak with a member of the team; team members (middle, from left) Kendal M. Wilkie, Dr. Catherine M. Weaver and Selina M. Nuñez huddle to discuss action plan for a patient; Dr. Mary M. Marfisee (bottom) points out a familiar dwelling along a freeway underpass, hoping to find a previous patient.

"WE HOPE THAT BY CREATING THIS DURABLE STRUCTURE ... WE CAN PLAY A SIGNIFICANT ROLE IN IMPROVING THE LIVES OF SO MANY PEOPLE WHO TOO-OFTEN FALL BETWEEN THE CRACKS."

SOMETIMES WHAT MIGHT SEEM LIKE A SIMPLE INTERVENTION CAN CHANGE A PERSON'S LIFE. Wilkie recalls one patient at a transitional-housing facility for people awaiting more permanent homes. The man was losing his vision, and "he assumed he was going blind and it was just something that he had to accept," Wilkie says.

A UCLA Health social worker, Selina M. Nuñez, got involved with the man's case, "and she really advocated for him," Wilkie says.

Because he was from Washington, the man had no local identification or medical insurance. "He was facing every barrier to care," Nuñez says. "The case manager at the site said they were unable to confirm his identity because he lacked a birth certificate."

Nuñez and the collaborative team brought in the UCLA Mobile Eye Clinic and scheduled an eye exam for the man. They learned that this patient wasn't going blind — he had cataracts.

In May, the man underwent surgery — at no cost to him — and his vision was improved.

"It instilled hope in him," Nuñez says. "Sometimes the biggest part of our job is to help folks build back their hope. It can be hard to see the light at the end of the tunnel when the things happening in their lives are so difficult."

ON A SIDE STREET OFF OF VENICE BOULEVARD is an encampment of tents, tarps and cars. "Let's see if we can get him to come out of the tent," says Mary M. Marfisee, MD (RES '05, FEL '06, '08), a family-medicine physician with two decades of street-medicine experience who is clinical medical director of the UCLA Homeless Healthcare Collaborative, as she approaches a dwelling. Getting people to come out of their shelter is crucial to understanding their well-being. Dr. Marfisee recalls a patient whose spine condition was so bad that he could not stand up to walk out of his tent. Fortunately, a resident physician was there to lift him onto a nearby broken office chair. It was then that they knew it was time to call paramedics.

Reluctant at first, the patient on this day knows Dr. Marfisee's voice and trusts her enough to come out. He is an unhoused man in his 50s who shares a pair

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DR. MARY M. MARFISEE

Students from the Student Run Homeless Clinics provide care to an isolated homeless patient on a street in Los Angeles.

The Most Important Lesson

By Charley Jang, MD '22

COMING FROM A FIRST-GENERATION IMMIGRANT FAMILY, I watched my parents struggle to navigate their way through a foreign and complex health care system. They strained to obtain affordable and adequate health care, and often refused to seek medical attention, even when it was clearly necessary, for fear of the financial burden. Seeing my parents forgo needed medical care and watching as their chronic illnesses worsened as a consequence, I made a commitment to reduce health care disparities for others.

The UCLA Student Run Homeless Clinics (SRHC) became the avenue for me to fulfill that commitment.

Staffed entirely by medical students, under the supervision of Mary M. Marfisee, MD (RES '05, FEL '06, '08), of the UCLA Department of Family Medicine, and community physicians, the SRHC provides basic medical care at various sites around Los Angeles to more than 1,600 patients experiencing homelessness each year. For many medical students, these are the first patients we see in our medical training.

I saw my first patient at a shelter in downtown Los Angeles. He approached us with worsening typical chest pain. We were concerned that his symptoms suggested acute coronary syndrome and called for an ambulance to take him to the emergency room. But when the ambulance arrived, the patient refused to go. He told us, "I don't need to go to the hospital" and "I don't want to go."

As a young medical student, I was ready to accept and respect — as we were taught to do — our patients' wishes and their autonomy. But something about this nagged at me, and I decided to ask why he didn't want to go to the hospital.

"I don't want to lose my bed," he said.

Equipped with this new understanding, we discussed the patient's needs with the shelter staff, and they agreed to hold his bed and store his belongings until he was stable enough to return.

It was from experiences like this that I learned an essential lesson in medicine: The most important thing we can do as physicians is listen to and seek to understand our patients. Only then, can we truly advocate for them.

As physicians, we can urge our patients to seek treatment and follow our medical advice. But, as in the case of my first patient, it is meaningless unless we listen to them and understand the circumstances in their lives that may be preventing them from following what we know to be the best course for their health.

Toward the end of my second year of medical school, I became administrative chief of the SRHC. Throughout my time with the program, I witnessed the compassion and empathy of my classmates, faculty and shelter staff. We became not only doctors-in-training, but also communicators, fundraisers and advocates.

At a clinic in Santa Monica, we met a man who sought our care after he was assaulted and robbed. We learned that he had been a store manager and was doing well until he lost his job. A difficult divorce followed, and he fell into depression. Unable to keep up with his mortgage payments, he eventually became homeless. Many of his possessions, including his hypertension and diabetes medications, were stolen. The man was frustrated because he was unable to get ahold of his primary care physician (PCP) to schedule an appointment. On top of that, his physician's office was hours away from the shelter, and he had no means of getting there.

Our students took the time to sit with him and do nothing more than listen to him talk about his struggles. We shared in his frustrations. Ultimately, we were able to request a new PCP, and also arrange for transportation through his case manager.

During the COVID-19 pandemic, our students again wanted to make a difference in their community. We put together hundreds of backpacks filled with hygiene products, clothes, blankets, water bottles and snacks donated by various organizations and community centers. We brought these to the tent encampments that line many of L.A.'s streets, and we provided medical care to the people living there.

At one of these encampments, we met a patient with a skin infection. He told us he had not visited a doctor in years. It was a struggle, he said, to get to appointments, taking multiple buses only to be met with rejection when he finally arrived because he was late. He felt judged by the health care system for being homeless, and for his history of substance abuse. He felt his medical concerns were not taken seriously, and he eventually stopped trying to access health care services. He lost trust in the system because he had felt invisible and dehumanized.

Again, our students sat with him and listened as he described his struggles and negative experiences. Over time, they rebuilt trust, and we were able to get him into a primary care clinic that would manage his multiple chronic conditions.

This is the foundation upon which I hope to build my future career as a physician and healer. The SRHC has repeatedly taught me the importance of compassion, empathy and non-judgmental medicine. Too often in medicine, I think, we refer to patients by their disease process — "the patient with congestive heart failure," for example — and forget the person who has the disease. Sometimes we lose sight of who the patient is and the struggles that they face.

It is through my involvement with the SRHC that I learned the most important lesson in medicine — to embrace the physician-patient relationship in which trust is cultivated and healing activated.

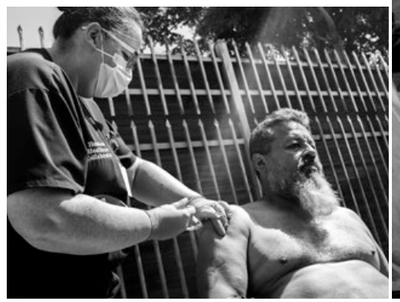
After repeated visits, our patients began to trust us and open up to us about the struggles they face, including the barriers of an inaccessible and inflexible health care system that they often felt judged them, not for who they were but for the circumstances in which they lived. Not at the SRHC. In our clinics, we saw our patients — and our colleagues — simply as people sharing in each other's struggles and laughing and cheering each other's achievements.

Thousands of medical students have passed through the SRHC since it was established in 1990, learning these lessons and gaining these experiences that have taught them about compassion, empathy and humanism in medicine. These are the lessons upon which they will continue to draw and pay forward as they mentor other students and colleagues and care for patients.

DR. MARY M. MARFISEE

***Dr. Charley Jang** is a first-year resident in internal medicine at NYU Langone Health in New York City.*

(Left) Nurse Kendal M. Wilkie provides care to a patient and (right, from left) Dr. Mary M. Marfisee, Brittany Jasker and Nancy Vega visit an encampment.



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of tents with his girlfriend. An overturned red patio umbrella separates the tents from scattered belongings that include a collection of grocery carts filled with boxes; a bicycle leaning against a tarp; an unplugged floor lamp; and a make-shift plywood table topped with vitamins, canned food, jugs of water and a snake plant. The couple have ornamented the entrance of their tent with a Halloween skeleton draped with a lei.

The man has irritant contact dermatitis, a condition that surely has worsened due to his poor living situation. Such conditions, as well as blisters, sores and open wounds, are common among people living on the street. Nancy Vega, RN, and Dr. Marfisee patiently and with evident kindness listen to the patient as he describes all of the home remedies he has tried. They give him a steroid cream and instruct him to apply it to his leg twice a day.

"We'll be back next week," Dr. Marfisee says as she and Vega move on to the next tent. "Continuity is everything. If we say we'll be back, we'll do it no matter what."

The next tent is home to a pregnant woman and her boyfriend. Dr. Marfisee calls out the woman's name, but there is no answer. Still, Dr. Marfisee promises out loud that she will come back.

"Some of this population move around the city," says Catherine M. Weaver, MD, (RES '17, FEL '18), administrative medical director of the UCLA Health Homeless Healthcare Collaborative. "I've run into patients in Santa Monica who say their primary care is located in Glendale. How easy do you think it is for someone who already lacks access to resources to get from Santa Monica to Glendale for an appointment at 3 p.m. on a Thursday?"

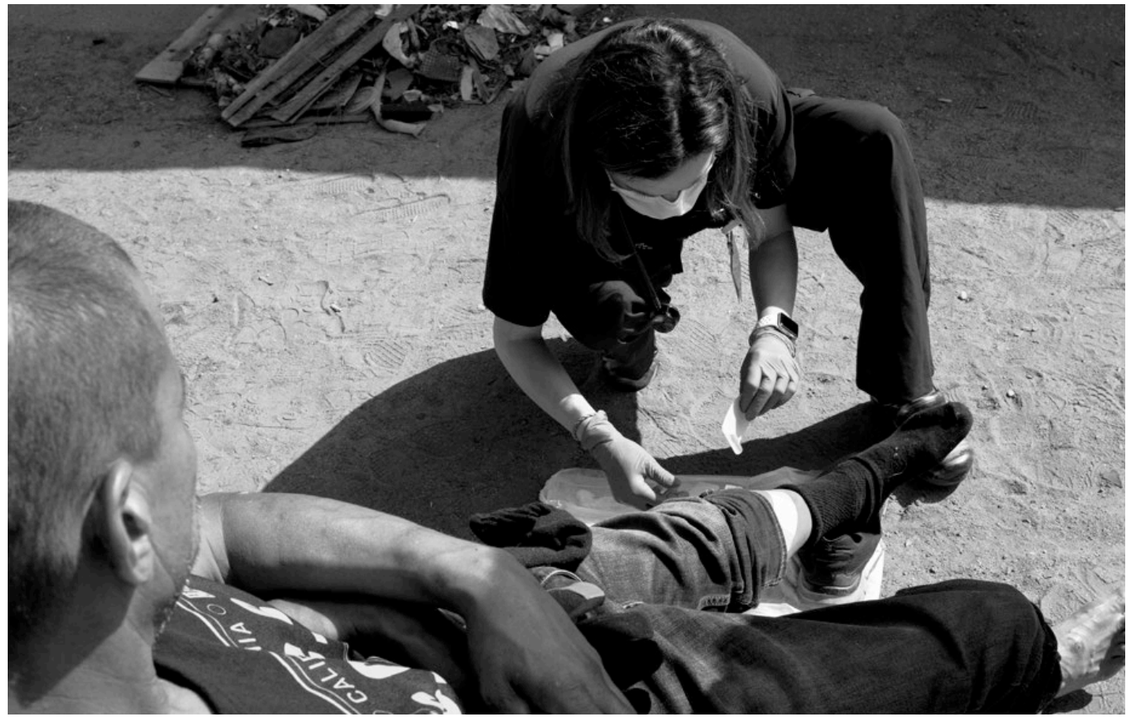
Many times, homeless patients end up in the ER. At the start of the COVID-19 pandemic, UCLA Health Quality Management Services and the UCLA Health Office of Health Equity, Diversity & Inclusion began analyzing data and found that over the past five years, UCLA Health emergency departments treated around 15,000 homeless individuals for various medical, psychiatric and social needs. Of those visits, 85% were due to primary- or urgent-care conditions that can be prevented or treated in a community setting, while 15% required specialty care or inpatient admission.

> "EVERYONE SHOULD HAVE ACCESS TO HIGH-QUALITY HEALTH CARE, BUT THE PLAYING FIELD IS NOT EVEN."

At the same time, an anonymous donor approached UCLA Health about funding a project to address care for people experiencing homelessness. "We combined the donor's vision with our data and a multidisciplinary team to think strategically about how we can effectively address the health care and social needs for this population. The timing was perfect, and there was great synergy," says Medell K. Briggs-Malonson, MD (FEL '12), co-executive sponsor of the collaborative and chief of Health Equity, Diversity & Inclusion at UCLA Health.

"Everyone should have access to high-quality health care, but the playing field is not even," adds Janet Rimicci, RN, senior director for UCLA Santa Monica Medical Center and co-executive sponsor of the collaborative. "In order to get to an equitable place where everyone has that access to health care, you have to adjust and tailor the approach not just for each population, but for each individual."

While there are several UCLA initiatives to provide care to people experiencing homelessness — including the Student Run Homeless Clinics, of which Dr. Marfisee has been the program director for nearly two decades; the UCLA Fielding School of Public Health's student-run Mobile Clinic Project, which has been delivering care on the streets of Hollywood for more than 20 years; and, with the Los Angeles County Department of Mental Health, the DMH + UCLA Public Partnership for Wellbeing — the model for the UCLA Health Homeless Healthcare Collaborative has a different structure, Dr. Briggs-Malonson says.



Dr. Catherine M. Weaver tends to sores on a patient's leg.

"We envisioned a highly professionalized care-delivery model when we created the UCLA Health Homeless Healthcare Collaborative. It was important to us that the care that we provide on the street be the same high-quality, compassionate care that we, as UCLA Health, provide in our brick-and-mortar clinics, emergency departments and hospitals," Dr. Briggs-Malonson says.

That model led to the creation of a three-phased approach to bring board-certified health care providers and equitable care services directly to the patients. It began with a pilot launch of two vans to bring services to West Los Angeles, South Los Angeles, Downtown L.A. and North Hollywood. The second phase, which is expected to launch in the fall with six vans, will expand primary- and urgent-care services and will include psychiatry and other specialty services. Physicians or nurse practitioners will remotely assist some of the nurse-led teams in the field.

Phase three will further integrate the collaborative's specialty-care services with those of federally qualified health centers, other health care providers and social-service partners to appropriately and effectively attend to the health and social needs of patients that cannot be addressed with a mobile clinic. This includes diagnostic studies, specialty care and additional enhanced case management.

"We cannot do this alone," Dr. Briggs-Malonson says. "We pride ourselves on building strong partnerships." She acknowledges that UCLA Health is not the first institution to marshal teams of health care professionals to deliver services to those experiencing homelessness. The UCLA-affiliated Venice Family Clinic and the Keck School of Medicine at USC both have well-established programs. "We respect the work that has been done by these and other organizations for decades," Dr. Briggs-Malonson says. "We are not here to compete — we are joining them in this important work fighting the health care and social ills that plague those who are experiencing homelessness, filling in the gaps in primary and specialty care that others may not be able to provide and doing our best to connect our patients to housing resources."

MARCIA ANN SANTINI, RN, CAN'T GET THE WOMAN COVERED IN LICE OUT OF HER MIND. It was a hot day, and there she was, sitting in the grass on a residential street near a nursing home in South Los Angeles. "From a distance, it looked like she had measles," the veteran emergency-room nurse recalls. "As we got closer, we saw that the bumps she was scratching at actually were lice. There were body lice head-to-toe."

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No Longer Alone

By Dan Gordon

HANNA BARCZYK

THE WOMAN LIVED FOR YEARS ON A SIDEWALK in South Los Angeles, and she had no intention of leaving. Her corner was a typical nondescript L.A. intersection, bustling with traffic and surrounded by a check-cashing business, a doughnut shop, a nail salon and a 7-Eleven. But the voices in her head demanded she stay. Loud and unrelenting, they encouraged her to bark and make shooting gestures at passersby. They convinced her she was a government spy. The woman's delusions compelled her to verbally assault anyone who approached her to offer assistance — and sometimes to hurl food at them.

While homelessness fundamentally is a problem of scarcity and unaffordability of housing, many unsheltered individuals also have severe mental illness — a formidable complicating factor that, among other things, may lead them to resist the mental health treatment that could begin to reverse their downward spiral, says Elizabeth A. Bromley, MD (FEL '04, '06), associate professor-in-residence of psychiatry and biobehavioral sciences in the UCLA Semel Institute for Neuroscience and Human Behavior and also a member of the UCLA Health Homeless Healthcare Collaborative team.

"We see actively delusional individuals who believe the CIA has stationed them at a particular bus bench to practice surveillance, and if that's their reality, they're not going to be persuaded to leave," Dr. Bromley says. "It's only with treatment, housing and support over time that those beliefs become a little less intense."

Treatment, housing and support is the tack being taken by the Los Angeles County Department of Mental Health's revitalized Homeless Outreach & Mobile Engagement (HOME) program, which sends teams of mental health specialists, nurse practitioners, social workers and street psychiatrists to intervene with individuals who are experiencing homelessness and who are suffering from severe mental illness. The program is part of the DMH + UCLA Public Partnership for Wellbeing, which connects the largest county mental health agency in the U.S. with one of the nation's leading public universities in a joint effort both sides describe as "deep, wide and bold."

Launched in 2019 out of UCLA Chancellor Gene D. Block and L.A. County Department of Mental Health Director Jonathan Sherin's shared commitment to strengthening the social safety net, the idea is to think bigger than psychiatry, bigger than mental health. "Well-being is possible when human beings have people to love, places to live and purpose in life," Dr. Sherin says. "While we of course have to get everyone the treatment they need and hopefully want, care cannot be effective if not delivered in inclusive, connected communities."

To get there has meant drawing from well beyond the UCLA Semel Institute for Neuroscience and Human Behavior to marshal campus experts in education, policy, law and social welfare, among others. It's also meant a non-traditional working relationship between a university and a government bureaucracy.

"The idea is to join the best of the university with DMH's expertise in practice and clinical services, and to have a partnership not just about disseminating knowledge from the university but [about] working together and learning from each other to advance well-being for the residents of L.A. County," says Patricia Lester, MD (FEL '00), Jane and Marc Nathanson Family Professor of Psychiatry at the UCLA Semel Institute and director of the DMH + UCLA Partnership. "When you look at disparities in people's ability to access high-quality mental health services, there are many ways in which our system has been letting people down."

Dr. Sherin, who has been a vocal critic of America's historic underinvestment in mental health and addiction services, says that the DMH + UCLA Partnership gives him hope that progress is possible. "We have massive collective problems that require collective solutions," he says. "This is a great example of that."

Dr. Bromley leads UCLA's support of HOME, which has logged a number of successes by bringing expertise directly to L.A. County's most vulnerable and providing access to treatment on the street. The goal is to lessen these individuals' distress, advance their functioning and improve their interest in accepting the help that can set them on a path toward more stable living.

"We try to come in from every angle," says Aubree Lovelace, HOME team program manager. "They might not want mental health services one day but might agree to a doctor treating their allergies or an offer of food or clothes. We draw them out and can spend more time getting them to open up to us. This consistency is the game-changer."

For the woman living on the sidewalk, the combination of persistent outreach, patience and expertise on the part of the HOME team ultimately lowered her defenses and increased her trust.

Team members helped her feel safe talking to a street psychiatrist and, eventually, taking medication for her schizophrenia. The voices got quieter. The woman obtained a Section 8 voucher and used it to secure housing. Today, she's relearning skills such as cooking, cleaning and grocery shopping, and HOME team members drive her to medical appointments.

Sitting in the lobby of the apartment building she now calls home, wearing a long black dress and with her hair pulled back neatly, the woman reflects on her journey. "It has been so good to have someplace of my own to go," she says, tears streaming down her cheeks. "Somewhere safe to sleep every night."

***Dan Gordon** is a regular contributor to* U *Magazine. Freelance journalist Melinda Fulmer contributed reporting to this story. A version of this article originally was published in the July 2022 issue of* UCLA Magazine.

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In more than three decades of nursing practice, Santini had never seen anything like it. "I immediately went into ER-mode," she says. "She needed to go to a hospital."

While Santini believed that immediate medical care was necessary, the woman didn't want it and refused any treatment. It would take time and patience to gain her trust.

Trust, Santini learned, is at the heart of street medicine.

> "FROM A DISTANCE, IT LOOKED LIKE SHE HAD MEASLES. AS WE GOT CLOSER, WE SAW … THERE WERE BODY LICE HEAD-TO-TOE."

She and her UCLA Health Homeless Healthcare Collaborative team came back the following week, and this time the woman allowed Santini to draw blood and wash her hair. They gave her food, clothing and new bedding, but didn't see her again after referring her to another street-medicine team for continuity of care.

"I don't think this case will ever leave me," Santini says. "It's like reading a book or starting a movie and not finishing it. I want to know how it ends. I want to know where she is and how she is doing."

EVERETT IS 62 YEARS OLD AND RECENTLY HOMELESS. He spent a month living on the street and the past several weeks in a downtown shelter for men. Wearing a white T-shirt, gray basketball shorts, black-and-red sneakers and a disposable facemask, Everett sits down at one of the black picnic tables where the UCLA Health Homeless Healthcare Collaborative team has set up for the morning.

Dr. Wheaton asks Everett if he'd like to have his blood pressure checked and if he has any aches or pains that he wants to talk about with her. Everett is living with insulin-depending diabetes. In addition to having had a stroke, he tells Dr. Wheaton that he also has a heart condition. For the past two months, Everett has been off his medications because they have been locked up in storage due to his housing situation.

Nurse Vega checks Everett's blood pressure and draws blood for a metabolic panel and an A1C test to measure his blood-sugar levels. He grimaces when Vega pricks his finger. She then walks the sample back to the van to be analyzed.

In the meantime, Dr. Wheaton contacts Everett's primary-care physician to get a list of his medications. The physician tells her that Everett is on several medications and recently had a checkup. Dr. Wheaton is relieved to hear that Everett is established with a primary-care provider and that the doctor's office was able to refill and route his medications to the shelter.

When Vega comes back, she informs Everett that his A1C is normal, and it has, in fact, come down from the numbers that his doctor provided over the phone. "Keep up whatever you've been doing," she tells him, smiling beneath her mask.

Everett responds that he's been minding what he eats and exercises when he can. He adds that he often gets breakfast at Denny's with his girlfriend and 11-year-old son, who are staying in a neighboring shelter. "I usually get the pancakes with the sugar-free syrup or a vegetarian omelet," he says.

With Everett's medication refills back on track, the medical team counts this as a small victory. "While our vans are fully equipped with a pharmacy, labs and many medical supplies, we're still in a van and there's only so much we can do," Dr. Briggs-Malonson says.

That, she says, "has been the greatest challenge — facing our limitations while still trying to make sure that all of our patients receive the medical, social and housing services that they need to thrive."

"Our unhoused neighbors are still our neighbors. They need to be treated with dignity and respect," says collaborative director Brian P. Zunner-Keating.

TO CRITICS WHO MIGHT SAY THAT STREET MEDICINE IS NOTHING MORE THAN A BAND-AID, Faysal Saab, MD (RES '16), has a response. "Sometimes if you don't put a Band-Aid on a problem, it gets worse," says Dr. Saab, associate director for UCLA Health's internal medicine Global Health Pathway. "Sometimes a Band-Aid can be very effective in terms of stabilizing a patient. Maybe street medicine can't help everybody, but for some people, it can make all the difference."

Dr. Saab adds that "we recognize lack of access to affordable housing is the most significant underlying problem leading to homelessness, but while local officials are working on solutions to that issue, we need to step in and address the existing health problems of this population so they do not get worse in the interim. As health care providers, it is incumbent on us to do our best to reach out to those in need in our community so that people do not suffer more than they already have."

The combination of medical and social services can have a powerful impact on the street. "When you pair social services with a nurse or a doctor — someone asking about their pain, their health problems, while sitting on the sidewalk with them and cutting their toenails so they can walk again — that looks and feels very different for a human being," Dr. Saab says. "It feels like someone is caring for you and wanting to help you."

It all comes back to trust. "If they know you're going to come every week, then they trust you," nurse Santini says. "They see that you care. I was cutting someone's toenails and I started to rub their feet and … the look in their eyes."

For a moment, Santini can't speak and she wipes away tears.

"Listening is huge," she continues. "Just allowing them to tell their story or talk about whatever they want to talk about. It's a different type of nursing, right? You don't have to be treating a wound or taking someone's blood pressure — you just listen. That means so much to them." ●

Jocelyn Apodaca Schlossberg *is a senior writer focused on equity, diversity and inclusion for UCLA Health Communications.*

For more information about the UCLA Health Homeless Healthcare Collaborative, go to: tinyurl.com/UCLA-Homeless-Health-Care

JOSHUA SUDOCK/UCLA HEALTH

"The more time I spend in the garden, the more I realize that you can't force things," says Dr. Deanna Attai.

Her Healing Garden

By Kelsie Sandoval

EVERY MORNING, DEANNA ATTAI, MD, strolls through her organic garden full of spaghetti squash, strawberries and sunflowers, taking stock of what needs water or trimming. This daily ritual of tending to her garden's herbs, flowers, fruits and vegetables is more than just a meditative hobby for the busy oncologic breast surgeon. Building and maintaining a garden taught Dr. Attai to cope with her own illness.

Dr. Attai's interest in gardening originated with the onset of an autoimmune disease in 2007. Feeling fatigued and experiencing joint pain, Dr. Attai sought out doctors to diagnose and treat her unprovoked symptoms. After seeing five rheumatologists over six-to-eight frustrating months of worsening pain, she finally was diagnosed.

As a breast-cancer surgeon, Dr. Attai approaches her patients' journies from diagnosis to treatment in a fairly straightforward manner. "An abnormality is detected, a needle biopsy is performed, and when the diagnosis of cancer is made, you initiate treatment — and often there is a good outcome," she says. But her experience in treating patients was a stark contrast to her own experience as a patient. "It's really hard to wrap a surgical brain around a disease that doesn't have a standard treatment protocol and is so poorly understood," Dr. Attai says. But she acknowledges that her own patients likely feel the same way when they are faced with a new cancer diagnosis — so many questions that don't have answers — and her experience has given her a better perspective on what many of her patients go through.

After getting a handle on her condition in 2008, Dr. Attai felt an urge to get back to basics and start a garden. In part, because eating a healthy diet eases the symptoms of autoimmune disease, but at the same time, "nature was calling," she says.

It took Dr. Attai many steps to get a full-fledged garden up and sprouting in the sunny valley where she lives. She first had to remove a pine tree in her backyard, and then, bit by bit, take out areas of grass. Once the space was cleared, she started to plant for a few hours on the weekends. Now, the 40-by-15-foot garden is brimming with galactic scabiosa (also known as "pincushion") flowers, cucumbers, green beans and more, occasionally providing Dr. Attai with an entire meal, like kabocha squash soup. And it also makes for a lively environment for lizards to find shelter and for bees to feast on pollen.

Working with the unpredictable forces of nature taught Dr. Attai valuable lessons that influenced her outlook on her autoimmune disease. "The more time I spend in the garden, the more I realize that you can't force things," she says. "You can set up everything right, but a severe drought or flood, or an infestation, will stunt the process. It's like you have to give up some level of control and roll with it. The same can be true for some illnesses."

As a surgeon, her prior approach to fixing problems was to address them head-on. "When things get really tough, I would hunker down and push through," she says. But that method did not alleviate or resolve her symptoms. After learning lessons from the garden, she applied them to managing her disease. While she checks off all of the cooperative-patient boxes—routinely getting tests and taking her medications — she knows there are limits to what she can do. "Working in the garden taught me to give up a little bit of whatever control I thought I had over my body and sort of give in to the disease," she says. Even though Dr. Attai continues to have episodes of unexpected pain or fatigue, the garden has made her feel more comfortable with the idea of uncertainty.

Beyond shifting her perspective on how she handles her illness, the organic garden is a welcome respite from Dr. Attai's busy day-to-day life as a physician. When she's not caring for patients with cancer, she has participated in social-media chats about breast cancer on Twitter, dispelling medical misinformation and building an online community with patients. In addition to treating patients and her engagement on social media, Dr. Attai is an active researcher. Her latest work has amplified the voices of women who would like to forgo reconstructive breast surgery after a mastectomy and remain flat-chested. This trend has empowered women to defy societal expectations on how they should look.

Throughout her busy days filled with caring for patients, the organic garden has been a years-long source of solace. "My garden has helped me a lot," she says. "I am much calmer and more at peace with my life."

Given the fulfillment she gets from tending her flowers and vegetables, Dr. Attai encourages medical students and residents to find an outlet outside of their work. Before her illness, Dr. Attai said she lived and breathed surgery, with little time to unwind. She believes that her 24/7 work lifestyle played a role in her developing an autoimmune disease. Discovering the meditative peace of gardening, she feels, saved her life. "If I hadn't been pulled out of myself, I don't think I'd be alive right now," she says. ●

***Kelsie Sandoval** is a senior media relations officer for UCLA Health. Before coming to UCLA, she was a member of the health-reporting teams for NBC News and the online news site Insider.*

AWARDS & HONORS

Dr. E. Dale Abel, Williams S. Adams Distinguished Professor of Medicine and chair and executive medical director of the Department of Medicine, was elected to the National Academy of Sciences.

Dr. Mopelola A. Adeyemo, clinical instructor of nutrition, was named a future leader advancing research in endocrinology by the Endocrine Society.

Dr. Elizabeth S. Barnert (FEL '14), associate professor of pediatrics, joined the National Commission on Correctional Health Care's board of representatives as the Society for Adolescent Health and Medicine liaison.

Dr. Timothy F. Cloughesy (RES '91, FEL '92), director of the UCLA Neuro-Oncology Program, was elected to the Association of American Physicians.

Dr. Judith S. Currier, chief of the Division of Infectious Diseases, was elected to the Association of American Physicians.

Dr. Daniel Geschwind (RES '95, FEL '97), Gordon and Virginia MacDonald Distinguished Professor in Human Genetics and director of the UCLA Institute for Precision Health, received the 2022 Cotzias Lecture and Award from the American Academy of Neurology.

Dr. O. Joe Hines (RES '97), Robert and Kelly Day Professor of General Surgery and interim chair of the Department of Surgery, received the 2022 Sherman M. Mellinkoff Faculty Award, the highest honor from the David Geffen School of Medicine at UCLA.

Dr. Varghese John, professor of neurology and director of the Drug Discovery Lab at UCLA, received a bronze prize from the Oskar Fischer Prize for Alzheimer's disease research.

Dr. Carol M. Mangione, chief of general internal medicine, was elected to the Association of American Physicians.

Dr. Gatien Moriceau, assistant adjunct professor of medicine and a member of the UCLA Jonsson Comprehensive Cancer Center, received the Young Investigator Award from the Melanoma Research Alliance.

Dr. Thomas Rando, director of the Eli and Edythe Broad Center of Regenerative Medicine and Stem Cell Research at UCLA, received the NOMIS Foundation Distinguished Scientist and Scholar Award.

Dr. Christina Puig Saus, adjunct assistant professor of medicine and hematology/oncology, a senior fellow at the Parker Institute for Cancer Immunotherapy and a member of the UCLA Jonsson Comprehensive Cancer Center, received the Young Investigator Award from the Melanoma Research Alliance.

Dr. Kalyanam Shivkumar (FEL '99), professor of radiological sciences, was elected to the Association of American Physicians.

Dr. Aparna Sridhar (FEL '13), associate clinical professor of obstetrics and gynecology, received the Martin-Peterson Scholars Award from the American College of Obstetricians and Gynecologists.

Dr. Renea M. Sturm (FEL '20), assistant professor of urology, received the 2022 Research Award of Distinction from the Urology Care Foundation.

In Memoriam

Dr. Jerome M. Hershman, Distinguished Professor of Medicine Emeritus and past chief of endocrinology at the West Los Angeles VA Medical Center, died on July 18, 2022. He was 89 years old. Dr. Hershman came to UCLA in 1972 as chair of endocrinology at the West LA VA, where he built the endocrine division, ran the inpatient endocrine service and developed an endocrinology fellowship program. He published more than 500 research papers, chapters and reviews. He received multiple honors and awards and was founding editor-in-chief of the journal *Thyroid* and past editor-in-chief of *Clinical Thyroidology*.

Dr. Norman S. Namerow (MD '58, FEL '62), professor emeritus of neurology, died on June 23, 2022. He was 91 years old. Dr. Namerow graduated among the first medical school classes at UCLA, completed his residency at UCLA and went on to dedicate much of his professional life to UCLA neurology and the field of neurorehabilitation. With a graduate degree in physics from UCLA, he applied his interest in that field to the study of physical medicine and how this influenced neurological disease, particularly recovery. He received the Outstanding Physician of the Year Award from the California Governor's Committee, and the inpatient rehabilitation center at Daniel Freeman Memorial Hospital, where Dr. Namerow served as medical director for more than 20 years, was named the Norman S. Namerow M.D. Rehabilitation Center in his honor.

Honoring 25 Years Advancing Pancreatic-Cancer Research

SOME OF THE MOST POWERFUL CHANGES IN MEDICINE have come about following a tragedy. In 1997, Ronald S. Hirshberg died from pancreatic cancer at the age of 54. That year, his wife, Agi Hirshberg, dedicated herself to advancing pancreatic-cancer research by establishing the Hirshberg Foundation for Pancreatic Cancer Research in memory of her late husband. As the first beneficiary of the foundation's giving, UCLA established the Ronald S. Hirshberg Translational Pancreatic Cancer Research Laboratory in 1998, and the Ronald S. Hirshberg Chair in Translational Pancreatic Cancer Research in 2000. The relationship was further solidified in 2015 following new philanthropic support from the Hirshberg Foundation, which launched the UCLA Agi Hirshberg Center for Pancreatic Diseases.

"The Hirshberg Foundation's generosity has helped elevate the UCLA Hirshberg Center to one of the nation's premier, comprehensive programs for pancreatic cancer and diseases," said Dr. O. Joe Hines (RES '97), director of the UCLA Agi Hirshberg Center for Pancreatic Diseases, interim chair of the Department of Surgery and Robert and Kelly Day Chair in General Surgery. "From the very beginning, Agi and her family and team at the foundation vowed to raise sorely needed funds for research to broaden treatment options and give hope to pancreatic-cancer patients. She continues to advocate for change and her dedication inspires physicians, researchers, patients and their families."

Twenty-five years ago, the Hirshberg Foundation was the only organization of its kind focused solely on finding a cure for this devastating disease. Since then, the partnership between UCLA and the Hirshberg Foundation has driven advances in the understanding and treatment of pancreatic cancer for the benefit of thousands of patients and their families. Through a wide range of activities, including fundraising, education, advocacy and patient support, this remarkable collaboration has opened the door to countless discoveries and shaped the future of pancreatic cancer treatment.

REED HUTCHINSON

(From left) Dr. Vay Liang W. Go, Agi Hirshberg and Dr. O. Joe Hines at the 2015 opening of the Agi Hirshberg Center for Pancreatic Diseases.

In 2022, the American Cancer Society reported an increase in the five-year survival rate for pancreatic cancer to 11%, up from 6% just 10 years ago. This tremendous progress speaks to the vision and determination of the Hirshberg Foundation to provide funding for high-impact investigations, and of the UCLA faculty who pursue innovative avenues of research.

The Hirshberg Foundation Seed Grant Program is one such area that has benefited from the foundation's funding. Directed by Dr. Vay Liang W. Go, Distinguished Professor of Medicine in the UCLA Vatche and Tamar Manoukian Division of Digestive Diseases and co-director of the UCLA Agi Hirshberg Center for Pancreatic Diseases, the program fosters leading-edge research on a global level by providing strategic investments in research that enable investigators to gather preliminary data that can then be used to apply for larger grants.

"Seed funding supports highly innovative research projects that are not usually funded by government agencies," said Dr. Go. "Agi understands this and is a valued partner in our work. Philanthropic support of this kind for early research is indispensable to investigations that have the potential to make a profound impact on this disease and create a roadmap toward better treatments and, one day, a cure."

Since 2005, 104 seed grants have been awarded to 40 medical-research institutions in the United States and internationally, resulting in myriad discoveries and approximately $130 million in National Institutes of Health funding. UCLA is a partner in administering these grants and about 30 UCLA research projects have benefited from this support through the years.

The foundation also has invested in the UCLA Pancreatic Tissue Bank, a vital resource for pancreatic disease researchers at UCLA and the wider scientific community; an annual symposium that brings together patients and families with leading researchers; and psychosocial support to those impacted by cancer and their families at no cost to patients at the Simms/Mann-UCLA Center for Integrative Oncology. The Hirshberg Foundation's 25th Annual LA Cancer Challenge 5K walk/run, which to date has raised more than $9.6 million mostly directed to UCLA for pancreatic cancer research, was held at UCLA in October.

ANGELA DAVES-HALEY PHOTOGRAPHY

(From left) Agi Hirshberg; Dr. Timothy Donahue (RES '09), chief of the UCLA Division of Surgical Oncology at UCLA; and Lisa Manheim, executive director of the Hirshberg Foundation for Pancreatic Cancer Research, at the 2019 LA Cancer Challenge 5K walk/run, for which Dr. Donahue was honorary medical chair.

> "SINCE ESTABLISHING THE FOUNDATION 25 YEARS AGO, WE HAVE BEEN UNWAVERING IN OUR MISSION TO BE RELENTLESS IN FINDING NEW WAYS TO ADDRESS AND HEAL PANCREATIC CANCER. OUR PARTNERSHIP WITH UCLA HAS AMPLIFIED OUR ABILITY TO MOVE THE NEEDLE IN RESEARCH AND WAYS TO HELP PANCREATIC CANCER PATIENTS."

"Since establishing the foundation 25 years ago, we have been unwavering in our mission to be relentless in finding new ways to address and heal pancreatic cancer," said Hirshberg. "Our partnership with UCLA has amplified our ability to move the needle in research and ways to help pancreatic cancer patients."

The special collaboration between UCLA and the Hirshberg Foundation for Pancreatic Cancer Research has laid the groundwork for a model in which the needs of people with pancreatic cancer are met in one location with the most advanced treatment options available. In addition to accelerating the pace of medical discovery, the foundation also has raised awareness of the disease and supports patients and their families at all stages of treatment and survivorship by disseminating information and providing resources. Construction of a new, state-of-the-art home for the UCLA Hirshberg Center in the Vatche and Tamar Manoukian Medical Building is in progress.

"My husband, Ron, always thought a problem was an invitation: 'No' meant 'maybe' and 'maybe' meant 'yes.' It is with this strong determination that he battled cancer, and it is still the way the foundation will continue Ron's fight to win the battle against pancreatic cancer," said Hirshberg. "I know the crucial role philanthropy plays in fueling pioneering thinking and research and I am so proud of what the foundation's partnership with UCLA has accomplished. With our shared purpose, I am certain this is only the beginning of what we can do together." ●

For more information, contact Gretchen McGarry at: 310-794-4746

Taste for a Cure Raises Money for Cancer Research

GETTY IMAGES

(From left) Co-chair Dana Walden and co-hosts Ken Jeong and Rob Lowe.

CELEBRATING ITS 25TH YEAR, Taste for a Cure, the signature event of the UCLA Jonsson Cancer Center Foundation (JCCF), was held on April 29, 2022, at the Fairmont Century Plaza Hotel. With the theme "Celebrating 25 Years of Taste for a Cure," the evening raised vital funds for leading-edge research at the UCLA Jonsson Comprehensive Cancer Center (JCCC). During this special night, the 2022 Gil Nickel Humanitarian Award was presented to Michael Thorn, president of FOX Entertainment, and Rob Wade, president of FOX Alternative Entertainment.

Thorn is responsible for all scripted programming and development, as well as casting at FOX Network. He also oversees original scripted live-action and animated content for FOX Entertainment's Tubi, its streaming advertising-based video on demand, or AVOD service. Wade oversees the network's unscripted programming, specials and alternative development slate. He is responsible for FOX's No. 1 hit show, *The Masked Singer*.

With the event delayed for the last couple of years due to the COVID-19 pandemic, Wade joked, "Interestingly, we were supposed to receive this award in March of 2020, but, sadly, it was put on hold two times. So, in the great tradition of TV execs exaggerating their figures, I'd like to say how honored we are to win this award three years running. Or in streaming metrics: 1 trillion minutes."

GETTY IMAGES

Honorees Michael Thorn (left) and Rob Wade.

Knowing the impact Taste for a Cure has on escalating the pace of cancer research, JCCF board chair Randy Katz noted, "We thank Michael and Rob for engaging their friends and associates in this important event. The UCLA Jonsson Comprehensive Cancer Center is dedicated to accelerating discoveries that prevent and cure cancer, all toward helping patients live healthier happier lives, as shown by our research that led to 18 approvals from the Food and Drug Administration for new cancer treatments since 2014."

Rob Lowe, award-winning actor, producer, director, podcaster and star of FOX's hit drama, *9-1-1: Lone Star*, served as co-host. Lowe spoke emotionally about the fact that his mother, grandmother and great-grandmother had all been diagnosed with breast cancer.

Ken Jeong, award-winning comedian, actor, producer, writer, judge on FOX's *The Masked Singer* and *I Can See Your Voice* host and producer, shared, "I am here because of my wife, Tran. She is a triple-negative breast-cancer survivor going on 14 years cancer-free, so we both know firsthand the importance of the work that the UCLA Jonsson Comprehensive Cancer Center is doing. It's simple: science saves lives. Science saved my wife's life."

The evening also featured a musical performance by Grammy Award-winning artist Robin Thicke.

Attendees enjoyed tastings from Far Niente Winery, EnRoute Winery and other California vintners, as well as those from Italy and France. Guests were treated to a lavish array of dishes from Hinoki and the Bird, Lumière Brasserie and the Fairmont Century Plaza Hotel.

Event co-chairs, who dedicated their time to ensure the success of Taste for a Cure, included Joe Cohen, head of television at Creative Artists Agency; E. Brian Dobbins, talent manager, producer with Artists First; Jon Holman, president of The Holman Group; Jake Kasdan, producer, director, writer and filmmaker; Larry Maguire, vice chairman, president emeritus and founding partner of Far Niente Winery; Tendo Nagenda, vice president of Netflix Originals; Gary Newman, executive partner in Attention Capital; Erik Nickel, partner in Far Niente Family Wines; Keri Shahidi, producer with 7th Sun Productions; Sandra Stern, president of Lionsgate Television; Dana Walden, chairman of entertainment for Walt Disney Television; and Arthur Wayne, vice president of global brand marketing and communications at Brooks Brothers.

The Hollywood Reporter served as media partner, and Delta Airlines, Disneyland, the Los Angeles Dodgers and others donated to the live auction. ●

For more information, contact Jacqueline Farina at: 310-989-4399

L.A. Care's First Scholars Graduate from UCLA

COURTESY OF DIANNE ROQUIA

(From left) Dr. Tracy Nguyen; Dr. Richard Seidman, chief medical officer at L.A. Care Health Plan; Dr. Yesenia Calderon Leon; and Dr. Nguyen Pham at the graduation ceremony at UCLA.

AT A CEREMONY ON JUNE 3, 2022, Drs. Yesenia Calderon Leon (MD '22), Tracy Nguyen (MD '22) and Nguyen Pham (MD '22), three of the inaugural recipients of L.A. Care's Elevating the Safety Net Scholarship Program, graduated from the David Geffen School of Medicine at UCLA. Dr. Calderon Leon also was a member of the Charles R. Drew/UCLA Medical Education Program. Financial support provided by the scholarship relieves future physicians of the enormous debt that often comes with a medical school education, enabling community-minded physicians to choose medical careers that may be more meaningful to them, such as practicing in low-income areas.

"This graduation marks a successful milestone for L.A. Care Health Plan and our Elevating the Safety Net Scholarship Program, which launched in 2018," said John Baackes, chief executive officer at L.A. Care. "Like UCLA, we have a shared commitment to serving our local community and are proud to see our first scholarship recipients at UCLA graduate. We look forward to watching the progression of their careers working in under-resourced communities."

Now in its fifth year, the L.A. Care Elevating the Safety Net Scholarship Program provides eight students up to $350,000 each in full medical school scholarships. The scholarships support students from diverse backgrounds who have an interest in working in Los Angeles County and a dedication to serving in under-resourced communities. To date, L.A. Care Health Plan has contributed approximately $9 million to UCLA, including about $1.5 million annually for four full-ride scholarships at the university.

"L.A. Care Health Plan's commitment to medical education at the David Geffen School of Medicine at UCLA has demonstrated the significance of scholarship support in breaking down financial barriers that might prevent recipients from pursuing careers in under-resourced communities," said Dr. Clarence H. Braddock III, executive vice dean and vice dean for education in the David Geffen School of Medicine at UCLA and Maxine and Eugene Rosenfeld Chair in Medical Education. "The L.A. Care Elevating the Safety Net Scholarship Program leads the way in supporting outstanding, aspiring physicians dedicated to social justice and addressing inequity in health care delivery."

A diverse and collaborative community, the David Geffen School of Medicine at UCLA has a vision to create world leaders in health and science who are encouraged to discover the basis for health and cures for disease. In 2021, it marked its 70th anniversary, making it the youngest top medical school in the nation. In 2022, it was ranked in the top 15 of Most Diverse Medical Schools in the nation by *U.S. News & World Report*.

Drs. Calderon Leon, Nguyen and Pham, all the first doctors in their families, will serve safety-net communities comprising uninsured, low-income and other vulnerable patients. The scholarship underscores the importance of community service and ensures that financial barriers do not deter students from pursuing the career of their dreams.

Following graduation, Dr. Pham will begin his internal medicine residency at UCLA. "Without speaking English, my parents struggled a lot with the health system and not having a voice when we immigrated, so I became their voice for a large part of our transition to the United States," he said. "I chose internal medicine because it represents that voice for me, the opportunity to be the primary provider and guide for my patients."

Receiving the L.A. Care scholarship was instrumental in Dr. Pham's growth at UCLA and served as a constant motivator and reminder of his own passion for community and education advocacy. Aspiring to empower students to pursue a career in medicine and become advocates for their own communities, Dr. Pham co-founded the student organization DREAM — Driving Resilience through Empowerment, Advocacy, Mentorship — that

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"LIKE UCLA, WE HAVE A SHARED COMMITMENT TO SERVING OUR LOCAL COMMUNITY AND ARE PROUD TO SEE OUR FIRST SCHOLARSHIP RECIPIENTS AT UCLA GRADUATE. WE LOOK FORWARD TO WATCHING THE PROGRESSION OF THEIR CAREERS WORKING IN UNDER-RESOURCED COMMUNITIES."

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enables UCLA medical students to mentor high school students, and helps them explore medicine in ways that previously were not available to them.

"My experience with DREAM shaped my future goals, as with each student I was able to engage with I felt motivated and compelled to continue and improve my pipeline program to reach more disadvantaged students in the future," said Dr. Pham. "When I personally mentored students, my L.A. Care scholarship served as a symbol of hope and proof that with resilience, medicine is within reach for immigrant students like myself."

Dr. Nguyen was born in California to parents who emigrated from Vietnam. After graduation, Dr. Nguyen

"THE L.A. CARE ELEVATING THE SAFETY NET SCHOLARSHIP MADE SURE I COULD FOCUS ON THE MOST IMPORTANT PART OF MEDICINE TO ME, WHICH IS DIRECTLY CARING FOR THE COMMUNITY."

is headed to the University of California, Davis to work in emergency medicine. "I have always wanted to be able to care for all individuals who walk through the doors of the hospital," she said. "Due to the nature of this specialty, in the truest sense I can work at the very front lines of the hospital."

Dr. Nguyen believes the time she spent volunteering with the UCLA Mobile Clinic Project and doing clinical rotations in the Ronald Reagan UCLA Medical Center Emergency Department helped shape and guide her decision to pursue emergency medicine. The L.A. Care Scholarship also proved pivotal in helping Dr. Nguyen pursue a career in her chosen field without the financial burden of student debt, especially with an uncertain future job market.

"The L.A. Care Elevating the Safety Net Scholarship made sure I could focus on the most important part of medicine to me, which is directly caring for the community," she said. "I was fortunate to be able to really hone into my passion for medicine, patient-centered care and outreach opportunities. This scholarship was instrumental to my academic success and my ability to pursue a field that I am most passionate about."

Following graduation, Dr. Calderon Leon will pursue family medicine at the Kaweah Delta Health Care District in California's Central Valley. ●

For more information, contact Emily McLaughlin at: 310-794-4763

ADVANCING PEDIATRIC SOCIAL WORK

The UCLA Health Department of Care Coordination and Clinical Social Work has received an anonymous $500,000 contribution to benefit pediatric social work and the greatest needs of UCLA Mattel Children's Hospital. This funding will provide families with financial assistance for a range of challenges experienced by the hospital's most vulnerable patients, including those who are underinsured. This patient group and their families who need to be close to the hospital for extended care receive help with housing and living expenses — including food, parking and transportation vouchers, as well as funds for prescription copays and durable medical goods.

For more information, contact Ellen Haddigan-Durgun at: 310-321-8366

CONTINUED FUNDING FOR OLOFSON SCHOLARSHIP

COURTESY OF THE OLOFSON FAMILY

Tom and Scott Olofson.

Scott Olofson and his wife, **Zuzana**, through the Tom W. Olofson Family Foundation, have renewed their commitment to funding the Tom W. Olofson Scholarship in the UCLA Center for Prehospital Care. The scholarship provides full and partial scholarships to all three annual UCLA Paramedic Program classes, with up to six scholarships per year. The full scholarship covers tuition and required materials; the partial scholarship of $2,000 assists with tuition. As of 2019, 20 people have received the Tom W. Olofson Scholarship, with the next two recipients scheduled to receive the award in September 2022. Scott Olofson graduated from the UCLA Paramedic Program in 1996, and his experience as a paramedic has stayed with him throughout his career. The scholarship is dedicated to Scott's father, Tom Olofson, who was a successful business executive, investor and philanthropist. Scott continues his father's legacy by making it possible, through the scholarship, for paramedic students to pursue their dream jobs in emergency medical services. Scott keeps in touch with scholarship recipients as they go through the program, graduate and reach professional and personal benchmarks.

For more information, contact Noah Green at: 424-325-8184

IMPROVING THE LIVES OF LYMPHOMA PATIENTS

Karen Rosenfelt made a gift to the UCLA Jonsson Cancer Center Foundation to establish the Rosenfelt Family Endowed Chair in Lymphoma in the David Geffen School of Medicine at UCLA. This endowed chair will support a faculty member in the Division of Hematology/Oncology with expertise in lymphoma. An international search is underway to identify the inaugural chair holder, who will advance the Rosenfelt family's mission to improve the lives of patients challenged by this complex disease.

For more information, contact Margaret Steele at: 310-968-0734

BRIDGING FUNDING GAPS IN MACULOPATHY RESEARCH

Wendy and **Ken Ruby's** gift to the Eli and Edythe Broad Center of Regenerative Medicine and Stem Cell Research at UCLA will support maculopathy research and help bridge the financial gap that often exists between promising preclinical studies and clinical application. UCLA scientists are pursuing innovative strategies to unlock the potential of stem cells for the treatment of blinding eye diseases, including age-related macular degeneration and Stargardt disease. Philanthropy from the Rubys helps advance maculopathy research at the center, providing the foundation to successfully initiate a Phase I clinical trial in the next two years.

For more information, contact Sabrina Ayala at: 310-206-3815

SUPPORT FOR PROSTATE-CANCER RESEARCH

The Solich Fund has given $450,000 to the UCLA Department of Urology to benefit the prostate-cancer research of Dr. Robert Reiter, chief of the Division of Urologic Oncology, director of the Prostate Cancer Program and holder of the Bing Professorship of Urologic Research. Dr. Reiter is involved in all aspects of urologic oncology, with an emphasis on prostate cancer. This funding will help advance Dr. Reiter's translational investigations and prostate cancer treatment.

For more information, contact Molly Moursi at: 310-206-4565

DONORS HONOR UCLA HEALTH NURSES

With support from numerous philanthropic partners, UCLA Health celebrated Nurses Month 2022 in May. Donor contributions made it possible to provide meaningful recognition programs for the health system's more than 6,000 nurses and care partners. This year's celebration included gift cards for all nurses, complimentary breakfast, cookies and sweet treats, a pizza party and flowers on

ROBERT HERNANDEZ

(From left) Chief nursing executive Dr. Karen A. Grimley; Michelle Sanchez, DAISY Award for Nursing Excellence recipient; and Dr. Coleen Wilson, director of adult in-patient nursing.

all of the units. Nurses also received recognition through nursing-award programs that included the DAISY Award for Extraordinary Nurses and UCLA Health nursing awards honoring nursing excellence throughout the health system. The month served as an opportunity to thank UCLA nurses who worked tirelessly through the pandemic and demonstrated grit, commitment and caring. Funding to support Nurses Month this year included several repeat donors, such as the **Phantasos Foundation**, as well as UCLA Health System Board member **Norman Schultz**, who said he is "proud to continue support of UCLA Health nurses during Nurses Month by recognizing their dedication and patient-focused approach."

For more information, contact Noah Green at: 424-325-8184

GIFT ESTABLISHES ENDOWED CHAIR IN WOMEN'S LUNG HEALTH

Dr. Allan J. Swartz and **Roslyn Holt Swartz** have made a $2 million commitment to establish the Dr. Allan J. Swartz and Roslyn Holt Swartz Women's Lung Health Endowed Chair in the UCLA Division of Pulmonary, Critical Care and Sleep Medicine. The endowed chair will support a faculty member with expertise in women's health who will propel studies on sex differences in lung disease, the first chair of its kind in North America. Roslyn Swartz, a longtime member of the UCLA community, is a UCLA alumna and a member of the Iris Cantor-UCLA Women's Health Center Executive Advisory Board. She is passionate about helping advance research in this area and raising awareness about women's lung health issues. "Allan and I know the importance of supporting lung research," said Swartz. "Allan, who served at a number of major hospital systems in Southern California, is a survivor of lung cancer, and we are grateful to UCLA surgeons Drs. Frederick (Fritz) C. Eilber, (MD '95, RES '02), and Jane Yanagawa, (FEL '09), who successfully treated him."

For more information, contact Gemma Badini at: 310-206-9235

COURTESY OF CHRISTIE J. NELSON

Letter from Medyka

By Christie J. Nelson

I WAS ON A SABBATICAL IN LONDON WHEN RUSSIA INVADED UKRAINE in February. Four days later, I was a volunteer behind the wheel of a van in a convoy of seven vehicles driving 20 hours to deliver relief supplies for refugees on the Poland-Ukraine border.

I've been here ever since.

As my companions and I covered the nearly 1,900 kilometers to our destination, we wondered what we might encounter when we arrived. Would we see people who had been shot or injured by bombs? Children with burned or crushed limbs? We had no idea what to expect.

It was scary, but at the same time, I felt grateful to be doing something to try to help.

We arrived in the very early morning and unloaded our supplies at a warehouse. Someone then took us to the border crossing to see what was happening there. It was at least -10 degrees Celsius out, and people came up to our van window asking if they could sit inside to warm up. They were waiting for transportation to somewhere else — maybe in Poland, maybe in Germany or some other country — but nothing was moving, and they were freezing. And already there were human traffickers there, taking advantage of the situation and making victims out of victims.

"Yes, get in. Please come in," we said to the ones who wanted to get warm. I felt desperate to help.

We drove back to London, escorting a Ukrainian woman, Mariana, and her daughter. They had fled their city, which was under siege, and had to leave their grandmother behind. It was horrible for them; they were traumatized and in shock.

UCLA Health recreational therapist Christie J. Nelson, in the tent she commandeered for a women's and children's center, has been in Poland since the start of the war helping refugees from Ukraine.

I knew there was more that I could do. A few days after we returned, I got on a plane and flew back to Poland, where I set up a women's and children's center — little more than a small, trash-strewn tent that I commandeered from men working at the refugee center who wanted to turn it into a tea booth — at the border crossing near the village of Medyka.

In those early months, it was bitterly cold, and the line of refugees waiting to cross into Poland could stretch for two kilometers or more. It took days to get through. The route was littered with garbage. There were no bathrooms. Nearly everyone in that line was a woman or child. They carried what few possessions they could manage and slept outside in the wind and rain. And once they did cross, mothers often came to us with babies who were wet and chilled to the bone, nearly hypothermic. We brought them into the warm tent and gave them new, dry clothes, and provided the women with feminine-hygiene supplies.

It is mostly men working in the refugee center, but it's important for the women and children to see the smiling face of a female, someone who understands their needs and problems. I say to them, as best I can, in Ukrainian, "laskavo prosymo," "welcome," and try to make them feel comfortable. They are exhausted, and shy. I don't allow men into my women's tent.

The women are so grateful. So many hugs. For me, it feels close to a spiritual experience.

These women, my sisters, and children crossed the border fleeing in terror from bombs and gunfire and death in their towns and cities. Most left the adult and near-adult males in their families behind, many of them to engage, and perhaps die, in the fight against the Russians. Tears filled the eyes of many — tears of fear and tears of uncertainty for what lay ahead. I continue to be impressed by their resilience.

Sometimes the older women, the grandmothers, come and sit and talk with me. They've seen so much in their lives. The grandmas melt my heart. Though I've picked up some Ukrainian, I use a digital translator to communicate with them. They'll talk about things that are jovial and sweet, but then switch to the bitter truths of their new reality. "My beautiful city, it is destroyed," they will say. "My town is now rubble." It is so difficult hearing their stories. I try to imagine what it would be like if it were my town or my city — if it were Westwood that had been bombed and destroyed. I can't.

The days are very long, sometimes 18 hours or more, but the support I have received from my colleagues at UCLA, as well as family and friends, has been very gratifying. They send money to buy diapers and other supplies, and they offer encouragement.

One day a girl, maybe 10 or 11 years old, who was with her father, an American volunteer, handed me an envelope and said, "My class did a play about the Holocaust as a fundraiser, and I want you to take this money for your project." There was about $600. This is sacred money, I thought, a pure act of giving. I used it to buy sandals and summer clothes for the children.

DAVID GREENWALD

During a visit home, some of Nelson's young rehabilitation-therapy patients made cards — "We love you" and "Sending Courage"— for the Ukrainian children she is working with in Poland.

Over the months, the scope of my work has expanded. I'm no longer tethered to the border and have now crossed into Ukraine numerous times to deliver supplies to hospitals as far away as Lviv, a battered city about 90 kilometers east where basement windows are blocked over with sandbags, turning them into makeshift bomb shelters.

My head reels from many of the things I've seen. Being here is so different from anything I've done before, and the experience has changed me. Things that once seemed important don't anymore, and other things that were unimportant in the past now have new meaning. I love what I am doing here. I want to help and make some kind of contribution, and I will stay for as long as it takes.

Christie J. Nelson *is a recreational therapist at UCLA Resnick Neuropsychiatric Hospital.*

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