

# weillcornellmedicine

WINTER 2021



## Just Medicine

How Weill Cornell is fighting racism to improve equity and healthcare for all



# Weill Cornell Medicine

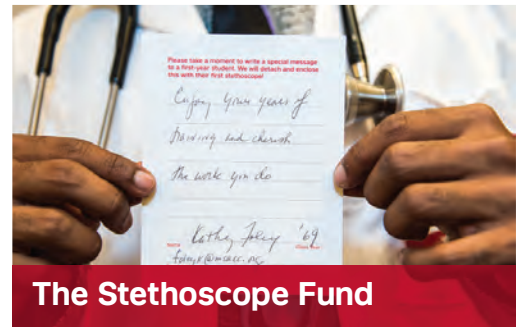
## Alumni Association

*The Alumni Association's mission is to foster lifelong engagement and connections between alumni, the medical school and current students.*

# Thank You, Alumni!



**Student-Alumni Connections**



**The Stethoscope Fund**

During this difficult year, our alumni have supported an array of virtual programs for students and graduates. Popular resources such as the HOST program, which connects alumni with fourth-year students, and Alumni-to-Student Knowledge (ASK) sessions, which allow students to connect with alumni on specific specialties, have moved online. With the help of the Alumni Association, these programs, among others, have continued to be successful in supporting our students and alumni worldwide.



**Funding Student Initiatives**



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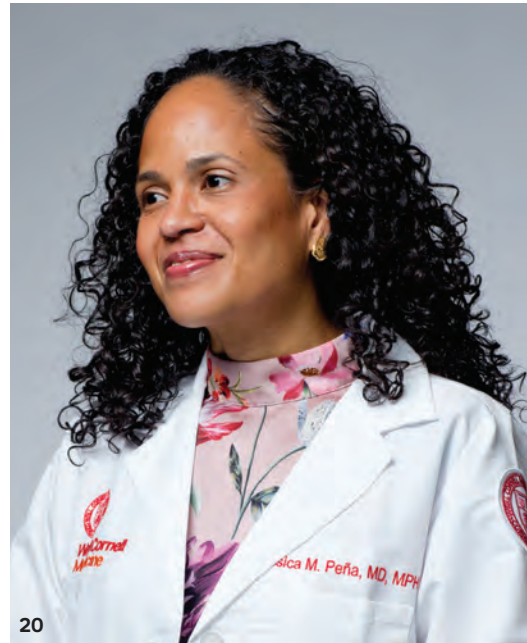
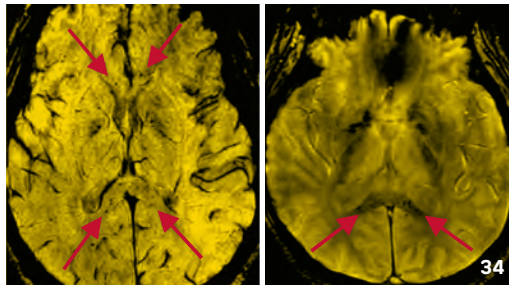
**HOST Program**



**ASK Program**

**For more information** about events and programs, please contact [alumni@med.cornell.edu](mailto:alumni@med.cornell.edu).

THE MAGAZINE OF  
WEILL CORNELL MEDICINE  
WINTER 2021



## Features

### 20 JUSTICE FOR ALL

Weill Cornell Medicine has long been a leader in its commitment to diversity and inclusion. But since the racial justice movement gained momentum last year, the institution has redoubled its efforts to promote equity and to encourage members of underrepresented groups to pursue careers in medicine and science. “This moment has provided Weill Cornell Medicine and our country with a unique opportunity,” says Augustine M.K. Choi, MD, the Stephen and Suzanne Weiss Dean of Weill Cornell Medicine and provost for medical affairs at Cornell University. “We must use the momentum of the past year to actively work against racism, including its effects on the STEM workforce and the disparate health of our diverse communities.”

### 28 MISSION: POSSIBLE

Normally, clinical research on therapeutics takes years—but the COVID-19 pandemic wouldn’t allow for such a lengthy timeline. As the number of patients hospitalized with the virus at NewYork-Presbyterian/Weill Cornell rose in 2020, WCM became a research hub for the rigorous investigation of COVID treatments and vaccines. And as Roy Gulick, MD, chief of the Division of Infectious Diseases, observes: “To do clinical trials in the middle of a pandemic was just extraordinary.” Results from those studies have contributed to a growing body of knowledge from around the world that has improved the care doctors can provide—helping patients recover faster and saving lives.

### 34 MIND & BODY

Among the most striking aspects of SARS-CoV-2—the virus that causes COVID-19—is that in severe cases, this respiratory ailment can cause damage throughout the body, including to the nervous system and brain. WCM researchers are investigating these effects and working to find better ways to prevent and treat them. As neurology chairman Matthew Fink, MD, notes, SARS-CoV-2 is not the only virus that can cause nerve damage—but it does seem to cause more than most. “The cognitive symptoms that sometimes result from COVID are also somewhat of a mystery,” says Fink, adding that neurologists “were struck by the prevalence of serious strokes, which is much higher than we’ve seen in other viral diseases.”

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Augustine M.K. Choi, MD  
Dean of Weill Cornell Medicine

## Why Medicine Must Actively Combat Racism



Advancing diversity in medicine has been one of my top priorities since I became dean of Weill Cornell Medicine. Since then, we have made many inroads that build on our institution's history of leadership in this area, including establishing an Office of Student Diversity, starting an annual Diversity Week, and—among the most impactful—launching a groundbreaking scholarship program that eliminates medical education debt for students in financial need. Still, it has become abundantly clear in recent months that we must extend our commitment to diversity to actions that work consciously every day to combat racism.

Like many of you, I have been horrified by the repeated incidents of race-related violence and police brutality against members of the Black community—cruelties that are symbolic of America's legacy of structural racism. It was gratifying to see so much

We at Weill Cornell Medicine have a responsibility as leaders in academic medicine to demonstrate what it looks like to confront inequality with self-awareness and transparency, and commit to the uplift and wellbeing of all.

of the country galvanized last summer by demonstrations calling for racial justice, to an extent not seen since the civil rights movement more than fifty years ago. It is disheartening, however, that there is a large sector of the population lashing back against this movement. Clearly, this issue is a polarizing one—which only emphasizes the importance and exigency of actions designed to

combat racism and promote greater diversity in the institutions that reflect our society's values. We at Weill Cornell Medicine have a responsibility as leaders in academic medicine to demonstrate what it looks like to confront inequality with self-awareness and transparency, and commit to the uplift and wellbeing of all.

To be truly inclusive, equitable, and effective as doctors, researchers, and educators, we must show faculty, staff, and students who are underrepresented in the STEM fields that they are welcome in our medical and graduate schools—and help them succeed and advance in their careers. Our cover story in this issue explains how we have recently put a number of initiatives in place to ensure greater fairness and belonging within our community, such as requiring annual anti-bias training for all employees and ensuring that our

medical and graduate school curricula include content on social determinants of health.

Progress is being made on a number of other fronts, too. We are seeking new and better ways to improve access to high-quality care for medically underserved patients. As an academic medical institution, we already know that disparities exist in healthcare, resulting in increased risk and worse outcomes in minority communities for conditions like hypertension, prostate cancer, and stroke. Such deep inequity has only been underscored by the coronavirus pandemic's disproportionately devastating effects on Black people, who die of COVID-19 at two to three times the rate of whites. As healers, we have felt the injustice of that burden, which has been compounded by ongoing structural inequalities including economic insecurity and greater rates of unemployment among Black communities because of the pandemic. The work of our Center for Health Equity, which develops new interventions that can surmount adverse health outcomes and is now aggressively studying COVID-19 health inequities, has never been more essential.

We're doing this important work not just because rejecting racism and bigotry is the right thing to do. Greater diversity in the biomedical workforce will lead to new and better treatments and cures for disease, since different voices and perspectives spur innovation. With a scarcity of Black male doctors in particular, we have an obligation to build the pipeline of physicians and scientists of color to make healthcare as effective as it can be.

Promoting diversity and equity has long been one of WCM's missions—but now more than ever, there is a profound urgency to heed that call. As we move forward with heightened efforts to address the discrimination and marginalization that our Black and brown colleagues encounter, we also look to a future in which medical leadership includes more women, Asian Americans, and other underrepresented groups.

We in academic medicine have a history of facing challenges, whether it's caring for patients with the rarest of life-threatening diseases or tackling an unprecedented pandemic like COVID-19. Combatting racism is as formidable a challenge. We can best overcome it by recognizing our blind spots and striving toward individual and collective awareness of the systems and behaviors we need to change so we can do better by our patients—and each other. ■



**Weill Cornell Medicine**

# A Strategic Investment in **Pediatrics and Infectious Diseases**

Dr. Sallie Permar, a distinguished physician-scientist who specializes in pediatric infectious diseases, recently joined Weill Cornell Medicine as the new chair of the Department of Pediatrics. Her recruitment is part of Weill Cornell Medicine's strategic investment in pediatrics and infectious disease research and clinical care, with a goal of raising more than \$60 million to support expanded translational research efforts in the Belfer Research Building.

The COVID-19 pandemic has reinforced the growing need for research of infectious diseases of all types—including areas in which Dr. Permar specializes. Recruited as the Nancy C. Paduano Professor of Pediatrics, she and her team are working on the development of vaccines to prevent mother-to-child transmission of such viruses as HIV, Zika, and cytomegalovirus (CMV), the most common congenital infection and a leading cause of birth defects. In her research, she also discovered a protein in breast milk that neutralizes HIV, the virus that causes AIDS.

"Dr. Permar will enhance our mission in both pediatrics and infectious diseases, building on our wealth of research as she collaborates with investigators and clinicians to improve the lives of children," says Dr. Augustine M.K. Choi, the Stephen and Suzanne Weiss Dean. "As a leading academic medical center, we must expand our investment in infectious diseases with an eye toward future global pathogens that can have a profound impact on human health."

To support Weill Cornell Medicine, please contact Christine Larchian, Director of Individual and Institutional Giving, at (646) 962-9511 or [chl2020@med.cornell.edu](mailto:chl2020@med.cornell.edu).





**“Dr. Permar will enhance our mission in both pediatrics and infectious diseases, building on our wealth of research as she collaborates with investigators and clinicians to improve the lives of children.”**

**Dr. Augustine M.K. Choi**

**Dr. Sallie Permar**, the new chair of Weill Cornell Medicine’s Department of Pediatrics

# Weill Cornell Medicine Joins NewYork-Presbyterian's Vaccination Efforts



**COMMUNITY OUTREACH:** Dean Choi (right) tours the Washington Heights vaccination facility with NewYork-Presbyterian Executive Vice President and COO Laura Forese, MD. Below: Pulmonologist Lindsay Lief, MD (left), an assistant professor of clinical medicine at WCM and an assistant attending physician at NewYork-Presbyterian/Weill Cornell, and Susana Morales, MD, an associate professor of clinical medicine at WCM and an internist at NewYork-Presbyterian/Weill Cornell, seen in Twitter images celebrating their shots.

In mid-January, NewYork-Presbyterian opened a large COVID-19 vaccination center at the Fort Washington Armory in Manhattan's Washington Heights neighborhood—and in less than a week, the facility had administered its 10,000th shot. The center, located in a 65,000-square-foot indoor track and field complex and featuring about seventy vaccine stations, is a collaborative effort by NewYork-Presbyterian, Weill Cornell Medicine, Columbia University Irving Medical Center, and New York State. "COVID-19 has taken a tragic toll on our communities," says **Steven J. Corwin, MD**, president and CEO of NewYork-Presbyterian. "Now, after nearly a year on the front lines, we are finally taking the fight to this deadly virus. We are proud to be working with New York State to vaccinate as many New Yorkers as possible and begin to restore the health and vitality of the city we all love."

Following state eligibility guidelines and aiming to get as many people vaccinated as quickly as possible, the institutions—in partnership with more than forty community- and faith-based organizations—launched an outreach program for eligible residents of Northern Manhattan. "We are focused on providing access, overcoming hesitancy, and addressing persistent inequities that too frequently result in people not getting the care they need," **Dean Augustine M.K. Choi, MD**, and other institutional

leaders said in a message to their constituencies.

The vaccine center's opening came in the wake of another milestone: on December 15, nearly 300 days after NewYork-Presbyterian diagnosed its first COVID patient, the hospital system received the initial shipment of vaccine for administration to its front-line healthcare workers. The first shots went to staffers in the intensive care units and emergency departments—the very people who saw the influx of COVID patients in the spring and who continue to battle the pandemic. For the staff, it was an emotional occasion that was about much more than protecting themselves. "This gives me hope for 2021 that we can help everybody around us without worrying about being the source of infection," said **Renu Mital, MD**, an assistant professor of clinical emergency medicine at WCM and an emergency medicine physician at NewYork-Presbyterian/Weill Cornell. "This is the best Christmas present ever."

As of late January, WCM had expanded its employee vaccination program to include all clinical faculty and staff, on-site support staff for clinical operations, and clinical researchers and their support staff who have direct patient/subject interaction or who work with live virus, as well as all faculty and staff aged sixty-five or older. The effort has included an internal campaign to address vaccine hesitancy and encourage all eligible team members to get vaccinated.



PHOTOS: THIS PAGE, TOP, COURTESY OF NEWYORK-PRESBYTERIAN; ALL OTHERS, PROVIDED





## Top-Flight Maternity Hospital Opens

NewYork-Presbyterian is now home to the Alexandra Cohen Hospital for Women and Newborns (above), a state-of-the-art facility dedicated to caring for women and their babies before, during, and after childbirth—including care for high-risk pregnancies and newborns who require extra support. Located on six floors of the NewYork-Presbyterian David H. Koch Center, the 246,500-square-foot hospital features seventy-five patient rooms and a sixty-bed neonatal intensive care unit (NICU). Its Level IV NICU is the first in New York City with a dedicated MRI and operating room. The facility nearly triples the space for the care of expectant mothers and newborns at NewYork-Presbyterian/Weill Cornell and will accommodate more than 7,000 births a year. The hospital was made possible by a \$75 million gift from the Steven & Alexandra Cohen Foundation, which also supported the creation of the Alexandra & Steven Cohen Pediatric Emergency Department at NewYork-Presbyterian Morgan Stanley Children’s Hospital.

## ACO Saves Medicare \$23.3 Million

According to the Centers for Medicare & Medicaid Services, NewYork Quality Care—the accountable care organization (ACO) of Weill Cornell Medicine, Columbia University Irving Medical Center, and NewYork-Presbyterian—saved Medicare \$23.3 million in 2019 and improved the quality of care for Medicare beneficiaries. The three institutions will share about \$11 million of those savings and will reinvest the funds into the ACO to further enhance quality of care. This is the third consecutive year that NewYork Quality Care—which provides healthcare for more than 37,000 Medicare beneficiaries—has earned shared savings through a program that incentivizes ACOs to reduce costs while providing high-quality, coordinated care.

## New PhD Program at Houston Methodist

Starting in 2021–22, the Weill Cornell Graduate School of Medical Sciences will offer doctoral degrees at Texas’s Houston Methodist in two fields: physiology, biophysics, and structural biology (PBSB) and neuroscience. The students will follow the same curriculum as their counterparts in Manhattan; they’ll conduct their research in Houston, be jointly mentored by Graduate School faculty located at both sites, and have the opportunity to travel to New York City for retreats. The program marks the first time that WCM is awarding the PhD degree outside of New York State.

## Symposium Highlights Drukier Winners

The winners of the fifth annual Gale and Ira Drukier Prize in Children’s Health Research—given to early career pediatricians who have made important contributions toward improving the health of children and adolescents—were honored last fall with an online symposium. They were physician-scientists **Stephen Patrick, MD**, associate professor of pediatrics and health policy at Vanderbilt University School of Medicine, and **Sallie Permar, MD, PhD**, then the Wilburt C. Davison Distinguished Professor of Pediatrics at Duke University School of Medicine. (Permar has since become chair of pediatrics at WCM; see story on page 8.) Patrick was recognized for work on neonatal abstinence syndrome, a type of drug withdrawal affecting infants exposed to opioids before birth, and Permar for developing vaccines for diseases transmitted from mother to child. The symposium also featured the annual Drukier Lecture in Children’s Health. It was delivered by **Stanley Plotkin, MD**, inventor of the rubella vaccine in use worldwide, who spoke about the history of vaccine development and its influence on the quest for a SARS-CoV-2 vaccine.

## Pigazzi New Head of Colorectal Surgery



**Alessio Pigazzi, MD, PhD**, has been named chief of colorectal surgery at NewYork-Presbyterian/Weill Cornell—returning to the institution where he completed his residency nearly two decades ago. A leader in his field, Pigazzi is an expert on the treatment of complex colon, rectal, and anal conditions and cancers, including laparoscopic, robot-assisted, and open surgical techniques. His research is focused on such topics as minimally invasive techniques to improve recovery after cancer surgery and the relationship between diet and colorectal cancer development. Previously chief of colorectal surgery and surgical oncology at the University of California, Irvine, Pigazzi earned his MD and doctorate at Boston University.

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## Leonard Tapped for Innovation Deanship



**John Leonard, MD**, has been named senior associate dean for innovation and initiatives. A specialist in lymphoma research and treatment, Leonard will lead efforts to foster a dynamic culture of entrepreneurship and innovation and promote commercialization opportunities for inventions developed by WCM investigators. He will head the newly created Office of Enterprise Innovation, which will serve as a “virtual front door” unifying WCM’s innovation and entrepreneurship services—including industry alliances and tech transfer activities such as patenting and licensing. “Getting new innovations across the finish line requires collaboration, often with industry partners, to scale up findings for application in healthcare,” says Leonard, also the Richard T. Silver Distinguished Professor of Hematology and Medical Oncology at WCM and an attending physician at NewYork-Presbyterian/Weill Cornell. “Ultimately, we want the work we do here to have a real impact on patients. By fostering an entrepreneurial environment, we can do that.”

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## Doctoral Alumna Leads Tech Licensing

**Lisa Placanica, PhD '09**, has been named senior managing director of WCM's Center for Technology Licensing—responsible for overseeing the institution's activities in technology management, marketing, licensing, and outreach to support Cornell's goals in commercializing technologies, promoting start-ups, and building partnerships. She comes to WCM from Mount Sinai Innovation Partners, where she was managing director for business development and licensing. An undergraduate alumna of Cornell University, where she earned a bachelor's degree in biology, Placanica received her doctorate in pharmacology from WCM, conducting research in the laboratory of **Yueming Li, PhD**, at Memorial Sloan Kettering Cancer Center. In her role as a part of WCM's Office of Enterprise Innovation, she will focus on developing strategies for expanding the institution's licensing opportunities to translate discoveries to the healthcare marketplace for the benefit of patients and society.

## Gaudino Directs Clinical Trials Office

**Mario Gaudino, MD**, has been appointed director of the Joint Clinical Trials Office at WCM and NewYork-Presbyterian, where he will oversee ongoing clinical trials and lead strategic planning efforts. Also the Stephen and Suzanne Weiss Professor in Cardiothoracic Surgery at WCM and a cardiothoracic surgeon at NewYork-Presbyterian/Weill Cornell, Gaudino will focus on increasing the number of active clinical trials available to WCM patients; that figure currently stands at about 400, roughly half of which are for the treatment of cancer. He also aims to encourage more physicians to get involved in clinical research and to strengthen the office's existing infrastructure and services that support investigators across the two institutions. As Gaudino observes: "My mentors said many times that something relevant to clinical research happens every day in a busy clinical practice—and that if you don't think that's true, you're not paying close enough attention."

## National Academy Honors Dean Choi

Dean Choi has been elected to the National Academy of Medicine. One of the highest honors in the fields of health and medicine, membership in the academy is given to individuals who have demonstrated outstanding professional achievement and commitment to service. In addition to serving as dean of WCM since 2017, Choi is an international authority in pulmonary and critical care medicine who has authored more than 375 publications, received multiple NIH grants, and earned numerous honors including the Ho-Am Prize in Medicine (known as the Korean equivalent to the Nobel) and the J. Burns Amberson Lecture, which recognizes major lifetime contributions to pulmonary research. He was one of 100 new members elected in 2020.

## Expert in Newborn Infections Is Peds Chair



**Sallie Permar, MD, PhD**, has been appointed chair of pediatrics at WCM and pediatrician-in-chief at NewYork-Presbyterian/Weill Cornell and NewYork-Presbyterian Komansky Children's Hospital. Dean Choi calls Permar, who was recently elected a fellow of the American Association for the Advancement of Science, "a distinguished physician-scientist, highly skilled educator, and proven leader." Permar's research focuses on the treatment and prevention of viral infections in newborns. She and her team are working on the development of vaccines to prevent mother-to-child transmission of viruses such as HIV, Zika, and cytomegalovirus—the most common congenital infection and a leading cause of birth defects, affecting roughly one in 150 newborns. Permar earned her doctorate in microbiology/immunology from Johns Hopkins University Bloomberg School of Public Health and her MD from Harvard Medical School. Recruited as the Nancy C. Paduano Professor of Pediatrics, she succeeds **Gerald Loughlin, MD**, who had served as chair since 2002 and will remain on the faculty as a professor of pediatrics.

### TIP OF THE CAP...

**Philip Barie, MD**, a professor of surgery at WCM and an attending surgeon at NewYork-Presbyterian/Weill Cornell, winner of the Lifetime Achievement Award from the Society of Critical Care Medicine.

**Sara Czaja, PhD**, director of the Center for Aging and Behavioral Research and a professor of gerontology in medicine, winner of the Gerontological Society of America's M. Powell Lawton Award, which recognizes outstanding contributions in gerontological research.

**Lorraine Gudas, PhD**, chair of pharmacology and the Revlon Pharmaceutical Professor of Pharmacology and Toxicology, named a fellow of the American Society for Pharmacology and Experimental Therapeutics.

**Ari Melnick, MD**, the Gebroe Family Professor of Hematology/Oncology, winner of the American Society of Hematology's Ernest Beutler Lecture and Prize.

**Virginia Pascual, MD**, the Ronay Menschel Professor of Pediatrics and director of the Gale and Ira Drukier Institute for Children's Health, who received the Distinguished Basic/Translational Investigator Award from the American College of Rheumatology.

**Zev Rosenwaks, MD**, director and physician-in-chief of the Ronald O. Perelman and Claudia Cohen Center for Reproductive Medicine and the Revlon Distinguished Professor of Reproductive Medicine in Obstetrics and Gynecology, who received a Lifetime Achieve-

ment Award from the American Society for Reproductive Medicine.

**Ellen Scherl, MD**, the Jill Roberts Professor of Inflammatory Bowel Disease, winner of the Rosenthal Humanitarian Award from the Crohn's & Colitis Foundation.

**Rahul Sharma, MD**, chair of emergency medicine at WCM and emergency physician-in-chief at NewYork-Presbyterian/Weill Cornell, winner of the Innovative Change in Practice Management Award from the American College of Emergency Physicians.

**Fei Wang, PhD**, associate professor of population health sciences, inducted as a fellow of the American Medical Informatics Association.

## FROM THE BENCH

### Key Insight into Arrhythmias



CRINA NIMIGEAN,  
PHD

A study that sheds light on how heartbeats are regulated could lead to new treatments for arrhythmias. The team, whose work was published in *Nature Communications*, conducted experiments on protein structures called ion channels, which are embedded in the outer membranes of virtually all cells and assist in biological processes; functioning as tiny valves, they allow flows of charged molecules into and out of cells. The investigators focused on a type closely resembling a “pacemaker” ion channel that helps human heart muscle cells control heartbeat rhythms. They found evidence that these channels, and the rhythms they impose on heartbeats, are naturally controlled by a known family of enzymes called prolyl isomerases—potentially pointing the way to new drugs to treat faulty cardiac rhythms. The study’s senior author was **Crina Nimigean, PhD**, professor of physiology and biophysics in anesthesiology.

### Organ Regeneration Research Funded



SHAHIN RAFII, MD

**Shahin Rafii, MD**, director of the Ansary Stem Cell Institute and chief of the Division of Regenerative Medicine, has received an Outstanding Investigator Award from the NIH’s National Heart, Lung, and Blood Institute for an ambitious project to accelerate regenerative medicine. If successful, the work could help bring about a new era in which diseased or damaged organs can be repaired in the patient or replaced by laboratory-engineered organs and their associated blood vessels made from patients’ own cells. “We have brought together a group of talented molecular, cellular, and computational biology experts, as well as biomedical engineers, to build organs from scratch,” says Rafii, also the Arthur B. Belfer Professor in Genetic Medicine. Rafii’s award will provide some \$1 million per year for seven years.

### Pandemic’s Impact on Addiction

Fear of COVID-19 and changes to healthcare delivery during the pandemic may be causing people to avoid seeking care for drug addiction. In the *Journal of Substance Abuse Treatment*, corresponding author **Sean Murphy, PhD**, associate professor of population health sciences, and colleagues presented preliminary data from four large New York City hospitals showing a sharp drop in addiction consultations when COVID cases were peaking in 2020. The authors note that their findings align with preliminary data that drug relapse and overdose rates nationwide have

risen substantially as a result of the pandemic. Citing concerns that fatal overdoses, HIV infections, suicides, and other negative effects will continue to increase, they encouraged increased collaboration by researchers, providers, and state agencies to better identify people with substance use disorders.

### \$19 Million Grant for HIV Research

WCM has received a renewal of a prestigious grant from the NIH’s National Institute of Allergy and Infectious Diseases to continue cutting-edge clinical research into treating and preventing HIV infection. The team—led by principal investigator **Roy Gulick, MD**, the Rochelle Belfer Professor in Medicine and chief of the Division of Infectious Diseases at WCM and NewYork-Presbyterian/Weill Cornell—will receive \$19 million in funding over seven years. The renewed grant will allow investigators to pursue clinical research in several areas including new drug delivery formats such as transdermal patches and implants under the skin; new approaches for treating coinfections that can occur with HIV, including hepatitis C and human papillomavirus; and ways to reduce and manage side effects of HIV treatment.

### Lymphoma Cause Explored



ARI MELNICK, MD

Researchers at WCM, NewYork-Presbyterian, and The Rockefeller University report that mutations in proteins that help package DNA in chromosomes are a frequent cause of lymphomas—findings that could lead to new approaches to treating these cancers, which strike 85,000 people in the U.S. annually and take more than 20,000 lives. Scientists had previously observed that mutations in the proteins, called histone H1, occur in lymphomas; the study, published in *Nature*, reveals that certain histone H1 mutations are indeed drivers of these cancers because they loosen areas of DNA that are normally tightly wrapped, allowing aberrant expression of certain genes. “It’s a very interesting set of findings that give us insights into the origins of lymphomas as well as the important role of histone H1 proteins in the maturation of cells,” says co-senior author **Ari Melnick, MD**, the Gebroe Family Professor of Hematology and Medical Oncology and a member of the Sandra and Edward Meyer Cancer Center.

### Telomeres Inform Cancer Treatment

WCM researchers have gleaned new insights into the ways cells maintain the tips of their chromosomes, known as telomeres. The findings, in *Communications Biology*, help illuminate a wide range of phenomena and could offer new targets for cancer therapy. A team led by senior author

**Neal Lue, MD, PhD**, professor of microbiology and immunology and a member of the Sandra and Edward Meyer Cancer Center, focused on the activity of two particular proteins that help replicate and protect telomeres using different molecular pathways. Disrupting the activities of either protein caused the cells to develop distinct telomere replication or maintenance errors as they divided—providing strong evidence that defects in these telomere proteins can drive abnormal DNA strand synthesis, separation, and splicing.

### Therapy Promising in Batten Disease



RONALD CRYSTAL,  
MD

A gene therapy developed by WCM and NewYork-Presbyterian investigators has helped slow progression of late infantile Batten disease, a rare and fatal genetic disorder in children. In the phase 1 clinical study, whose findings were published in *Science Translational Medicine*, researchers used a genetically modified virus to deliver a functional copy of a gene essential for brain health—which Batten patients lack—into the brain cells of children with the disease. “The gene therapy slows down the progression of the disease significantly; that’s very positive, but it’s not yet a cure,” says **Ronald Crystal, MD**, chairman of genetic medicine and the Bruce Webster Professor of Internal Medicine. “The next step is to turn it into a cure.” Typically, children with Batten disease begin developing symptoms—such as seizures and loss of motor and language skills—around age two to four, and only live between eight and twelve years.

### Sex Differences in Bypass Outcomes

A study led by investigators at WCM, NewYork-Presbyterian, and the University at Albany School of Public Health found that the risk of dying seven years after coronary artery bypass surgery was significantly lower in men receiving multiple bypass grafts rather than single grafts—but there was no apparent difference in mortality between these methods in women. The landmark finding raises important questions about why outcomes differ by sex and underscores the need for clinical trials in women. The investigators, whose findings appeared in *JAMA Cardiology*, analyzed data from more than 63,000 patients who underwent surgery from 2005 to 2014. “Previous evidence for women has been unclear, as women typically represent only about 20 percent of patients who undergo coronary artery bypass procedures overall and less than 15 percent of clinical trial participants,” says lead investigator **Mario Gaudino, MD**, the Stephen and Suzanne Weiss Professor in Cardiothoracic Surgery at WCM and a cardiovascular surgeon at NewYork-Presbyterian/Weill Cornell.



# Test Case

The effort to identify potential drugs to treat COVID-19 now has an arsenal of tiny yet powerful weapons: human organoids. Grown in the lab, these organ-like structures can be used for high-throughput testing of drugs' efficacy in blocking infection by the SARS-CoV-2 virus. In a study published in *Nature* in late October, a team led by investigators from Weill Cornell Medicine and NewYork-Presbyterian reported that they had used organoids to test about 1,200 drugs previously approved by the FDA for other diseases. They identified three promising candidates, one of which (the cancer drug imatinib) is being studied in a clinical trial for patients with severe COVID.

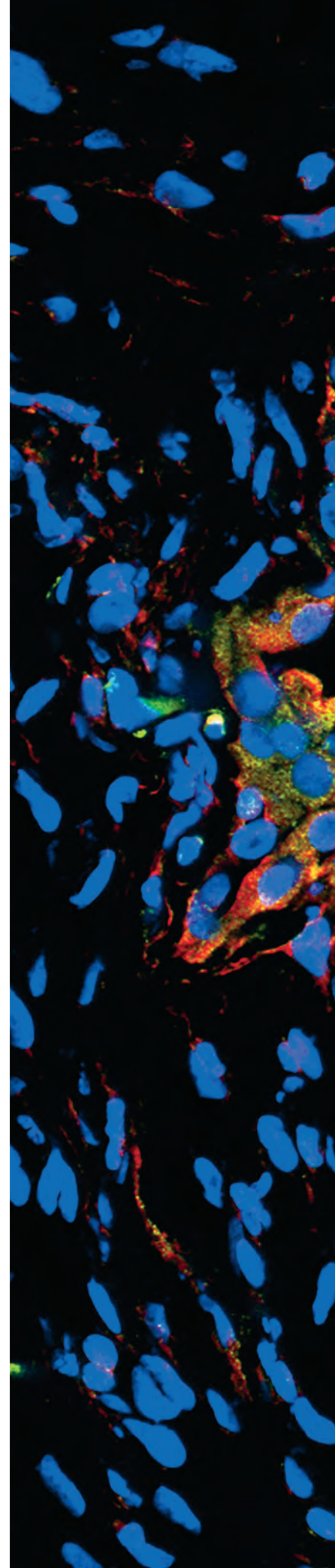
The team used two varieties of organoids, one containing cells found in the lung and the other in the colon; both cell types are known to be widely infected in COVID patients and are associated with worse outcomes. "These organoid models are significant, because they mirror what is seen when these types of cells are infected in patients with COVID-19," says co-senior author Shuibing Chen, PhD, the Kilts Family Associate Professor of Surgery, in whose lab the organoids were developed.

Another co-senior author, Robert Schwartz, MD, PhD, notes that because organoids can be made for every type of human organ, this screening method could help to identify drugs to treat numerous harmful effects of COVID. "If in fact we find the same drugs keep coming up, that's a hopeful sign that they could be effective for treating systemic infections," says Schwartz, an assistant professor of medicine at WCM and a hepatologist at NewYork-Presbyterian/Weill Cornell.

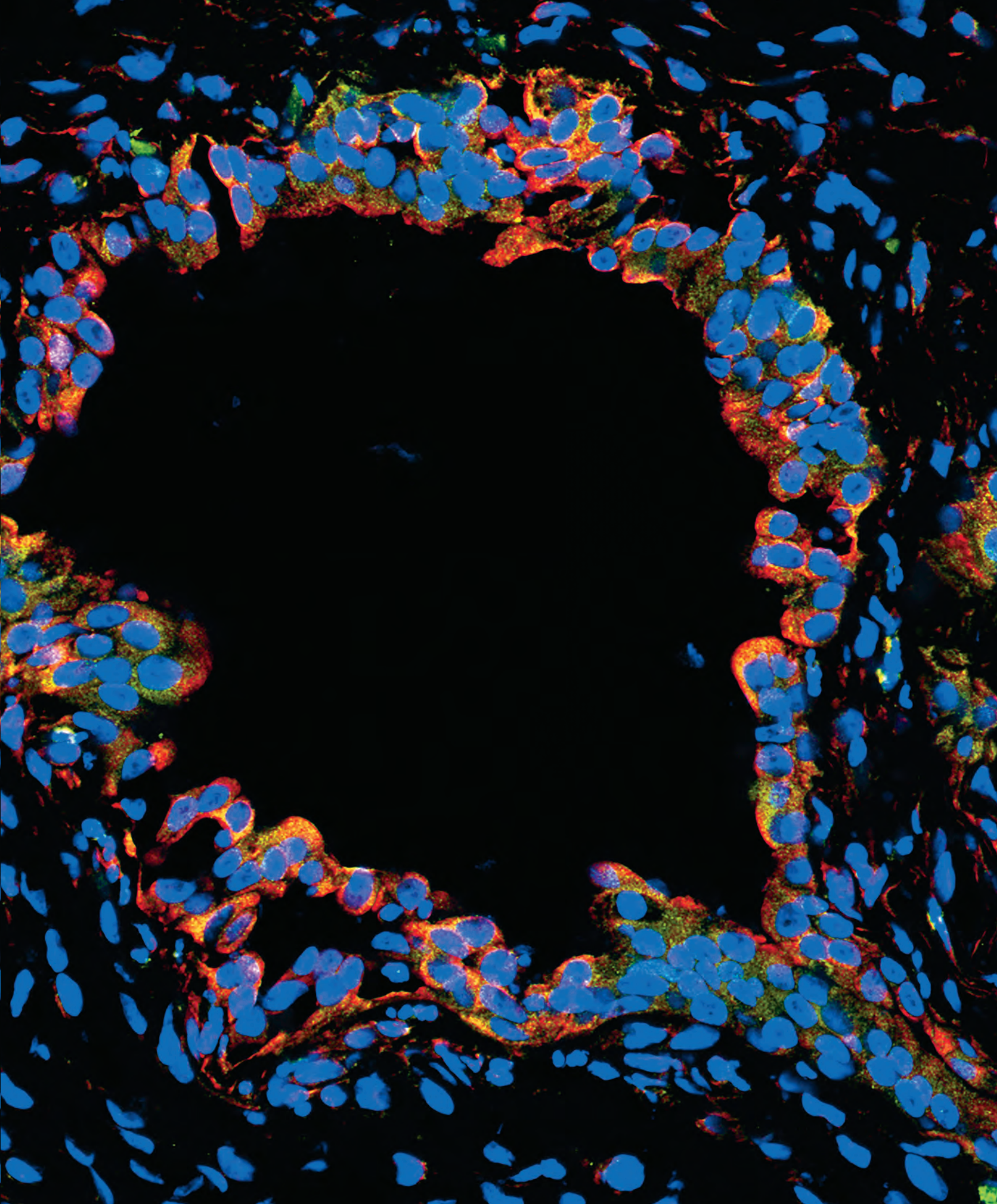
The research was highly collaborative, bringing together not only five different labs at WCM but also scientists from Columbia University and the Icahn School of Medicine at Mount Sinai, as well as colleagues from outside New York City. "In some ways this pandemic has brought us together," says co-senior author Todd Evans, PhD, the Peter I. Pressman, MD, Professor in Surgery and associate dean for research. "We are all laser-focused on this problem that acutely needs solving."

**MODEL SYSTEM:** In this lung cell organoid, receptors of SARS-CoV-2 are seen in green.

IMAGE COURTESY OF SHUIBING CHEN









## An Ounce of Prevention

Even during a pandemic, routine wellness and healthcare screenings remain vital



**CLINICAL CARE:** Weill Cornell Medicine experts have been stressing the importance of continuing routine exams (above). Opposite page: Telemedicine has played a key role throughout the pandemic, with physicians and patients communicating over secure portals to address a wide variety of health issues.

**V**inay Chadha is the finance director of a fitness company, and exercise has always been important to him. But when the pandemic hit New York City this past March, the thirty-seven-year-old found his activities drastically curtailed—first when he fell ill with COVID-19, then by the statewide shelter-in-place order. “It was very difficult for me, emotionally and mentally, through a lot of it, especially early on,” says Chadha, who lives alone near Manhattan’s Union Square. “I think two months went by where I didn’t see one person, in person, at all.”

Once he recovered from COVID, Chadha yearned to return to his fitness routine. With gyms closed, masked runs along the East River became his most important outlet. “I was a little bit slower,” he says. “But after the fourteen days of isolation, I ran seven miles. I don’t know if it was just the adrenaline or that I wanted to get out of the apartment so badly.”

Chadha is not alone in finding that the novel coronavirus,

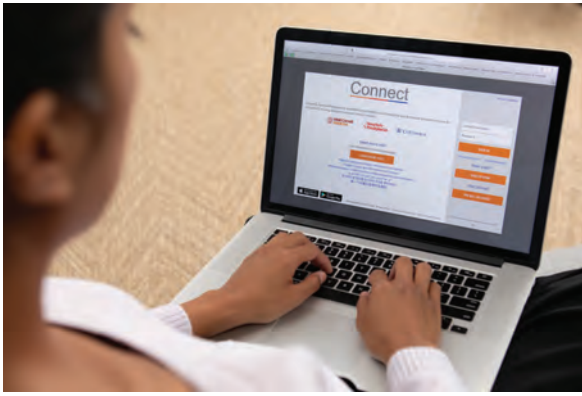
social distancing, and shelter-in-place orders make staying sane and healthy more difficult, even beyond the threat of the virus itself. New York City may have emerged from the worst of its struggle against COVID-19, but the global pandemic is far from over. WCM clinicians and patients have had to revise fitness routines, catch up with delayed screenings and vaccinations, and work to keep each other safe, whether by taking appointments virtual or following new protocols for office visits. And as they adapt to a changed world, they’re finding that medicine and wellness look different than they once did—and that healthcare and self-care may require new forms of creativity.

### STAYING FIT

Chadha needed to run, but he found that it exacerbated a long-standing knee issue—and the pain threatened to keep him indoors. For relief, he turned to Jaspal Ricky Singh, MD, vice chair

PHOTOS: GREY SKY FILMS





and associate professor of clinical rehabilitation medicine at Weill Cornell Medicine and co-director of the Weill Cornell Center for Comprehensive Spine Care, who had been treating Chadha since he tore his knee's anterior cruciate ligament in 2016. While at the time Singh's in-person clinic hours were limited to emergency appointments once a week, the pain and sports medicine specialist—like many of his WCM colleagues—made himself available to patients via telemedicine appointments, text messages, and phone calls, helping them figure out ways to mitigate pain and avoid weight gain even as gyms and rehab centers were closed.

For some who were recovering from injuries, walking the hallways of their apartment buildings was enough, while for others Singh devised routines of jumping jacks and pushups they could do in their living rooms. One arthritis patient in his late fifties had previously enjoyed spin classes at a local gym; with that option gone during the shutdown, he wasn't sure how to get aerobic exercise safely. Singh asked the man to walk up the stairs in his apartment building once a day. "It wasn't his ideal," Singh says, "but as he got used to it, he actually noticed his legs were getting stronger, and the stability in his core was getting better."

When the pandemic shutdown began, many New Yorkers—unaware back in March of how long it would last—treated the first several weeks as a "vacation" from exercise. But as time has passed, Singh has found that his patients are becoming more accepting of alternative fitness approaches. "They've realized that COVID is not ending anytime soon," he says, "so they've got to strategize and compromise on things that they can do." Singh taught Chadha exercises he could do in his apartment to strengthen his leg and help him tolerate the pain; they helped him get through the next several months of shutdown, and Chadha is confident that his fitness routine will help him stay physically and mentally fit as the pandemic continues. "He knew being able to get out there and stay fit was important to me," Chadha says.

#### KEEPING UP WITH CARE

Self-care may be crucial during the COVID-19 pandemic, but that doesn't mean it's a substitute for healthcare. So in addition to sharing advice for staying well at home, WCM practitioners are



actively urging their patients to resume their pre-pandemic schedules of routine screenings and checkups. "Preventive care has fallen to the wayside," says Rachel Smerd, MD, an assistant professor of medicine at WCM and an internist at NewYork-Presbyterian/Weill Cornell. "We are seeing delays in screening tests like colonoscopies and mammograms. We're telling everyone now, 'Go see your doctor and make sure you're up to date.'"

That counsel applies to patients of all ages—but pediatricians are especially concerned that children may miss scheduled vaccinations. "Putting them off can cause an outbreak of a vaccine-preventable illness, such as measles," explains Jane Nestler, MD, an instructor in

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**'It's especially important for children under age two or three to be seen frequently, to monitor their developmental milestones,' says Jane Nestler, MD.**

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pediatrics at WCM and a pediatrician at NewYork-Presbyterian/Weill Cornell. "Children are still at risk of contracting these illnesses even if they aren't in school or daycare. And a key thing to remember is that vaccines don't only protect the child who's getting them; they also protect those who are unable to receive them, such as newborns or people with suppressed or compromised immune systems."

Beyond vaccines, Nestler urges parents to make sure that they are keeping up with regular well-child visits, including hearing and vision screenings and physicals. "It's especially important for children under age two or three to be seen frequently, to monitor their developmental milestones," Nestler says, explaining that the earlier that developmental delays or autism spectrum disorders are detected, the more effective interventions may be. And for older children, routine visits to the pediatrician often include mental health evaluations—something that Nestler has found to >



**SELF CARE:** Good practices for mental and physical wellness include getting regular exercise (opposite page and above) and carving out calm spaces at home (left), particularly in an era of widespread telework.

be especially crucial during these stressful times. “Many mental health problems are going undetected, which is another important reason why well-child care is so vital,” she says. “Children might not feel comfortable bringing it up to their parents, but if the doctor is concerned about their demeanor or behavior during a visit, they could refer them to a therapist or psychiatrist.”

And while patients and their families may still worry that visiting hospitals and doctors’ offices puts them at risk of contracting COVID-19, primary care clinicians stress that patients can look for preventive measures many healthcare facilities have adopted to keep patients and personnel safe, including offering COVID vaccines to clinical staff. In such spaces, “there are a lot of levels of security,” Smerd says. “Everyone’s wearing a mask, and there’s usually a tool to screen for symptoms. The buildings have their own cleaning protocols; in our practice, there’s somebody walking around all day, cleaning the high-touch places. If somebody’s showing symptoms, those exam rooms are not used again that day. But just to be safe, we assume everybody does have asymptomatic COVID.”

At WCM, in addition to resuming in-person appointments, clinicians are continuing to see patients via telemedicine—which became a vital resource during the height of the pandemic, for both emergency medicine and primary care. WCM’s Digital Health Services reported an unprecedented 10,000 primary care appointments per

week last spring—and although physical offices have reopened, between 6,000 and 7,000 patients a week still take advantage of virtual visits.

WCM physicians began experimenting with telemedicine about five years ago. This year, says Jonathan St. George, MD, it has emerged as a vital resource. “COVID changed everything,” says St. George, an assistant professor of clinical emergency medicine at WCM and an attending physician in the ED at NewYork-Presbyterian/Weill

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**Nutrition isn’t just about balancing proteins, starches, and vegetables, dietitian Janet Lau stresses; there is also a psychological component.**

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Cornell. “Forget the convenience; it became a safety issue and a care issue. And patients really took to it. They understood that during the surge, the hospital became a place that was really for the sickest patients.” St. George acknowledges that with telemedicine, there is a learning curve for both doctor and patient. Physicians, for their part, have had to learn alternative methods of conducting physical exams. “You have to ask your patient to cooperate with you in new ways to be able to get the information you need,” he says. “I can’t feel their pulse, for example, so I might ask them to do it themselves,





and I'll have to walk them through the process. It just requires a different methodology, and doctors need to train to do it effectively."

### HEALTHY HABITS

Besides complicating exercise and medical care, the pandemic has also made it harder for many people to make healthy eating choices. Janet Lau, a clinical outpatient dietitian at WCM's Center for Integrative Health and Wellbeing, found that many of those she works with struggled in the early weeks of the shutdown. "Everybody was just figuring things out at that point," she says. "People were staying in more and lots of restaurants were closed, so they were left to their own devices and needed to cook more. Some were actually eating healthier because suddenly they had the time, but on the other end of the spectrum there was a lot of emotional eating. People definitely had that weight gain—the 'COVID fifteen.'"

As patients have returned to the center, Lau, who often works in partnership with a physician, has been helping them plan meals and build structure into their days so they don't lose control of their eating habits. But nutrition isn't just about balancing proteins, starches, and vegetables, Lau stresses; there is also a psychological component. "You can look at what's happening now as a horrific situation that's taking you out of your norm and into a really dark place," she says. "Or you can look at it as a positive challenge and start thinking about cooking in terms of, 'What spices have I missed out on? What's a new food that I haven't tried? What do I have time to consider now, that I never had time for before? How can I make sure my kids are eating healthier versus what they may have been served at school or when they are with their peers?' You can say to yourself, 'This is a time for self-care, a time to get in tune with what I and my family need to do to get healthy.'"

— Amy Crawford



# Machine Learning

Can 3D printing make nuclear medicine more accessible worldwide?



PHOTO: JOHN ABBOTT

John Babich, PhD

**M**edicines that contain radioactive isotopes—known as radiopharmaceuticals—are used to treat cancer and to help physicians diagnose a wide variety of conditions through imaging. But while radiopharmaceuticals are a standard and invaluable medical tool in the field of nuclear medicine, synthesizing them can be challenging. They must be prepared immediately before use, and exposure to their radiation poses a danger to the people who manufacture them. Due to these logistical barriers, many specialized radiopharmaceuticals are out of reach of all but the largest hospitals.

Now, however, a team of Weill Cornell Medicine researchers has found a simple solution that has the potential to make specialized radiopharmaceuticals more accessible: using 3D printing to build the machines—known as automated synthesis units (ASUs)—that manufacture them. It's a development that could reduce the cost of specialized radiopharmaceuticals by orders of magnitude, making them accessible to many more clinicians and patients worldwide.

Current commercial ASUs are large and heavy, costing as much as \$250,000. John Babich, PhD, chief of radiopharmaceutical sciences in radiology and a member of WCM's Molecular Imaging Innovations Institute (MI3), likens them to high-end sports cars. A plastic, 3D-printed machine, on the other hand, is more like a Smart car: small, lightweight, and inexpensive, but still perfectly useful. "If we just need to get to work, we don't need a Mercedes-Benz," says Babich, who worked on the 3D printing project with colleagues James Kelly, PhD, assistant professor of radiopharmaceutical sciences in radiology, and Alejandro Amor-Coarasa, PhD, a former WCM postdoc who's now on the faculty at Albert Einstein College of Medicine.

Radiopharmaceuticals are injected into a patient's body and taken up by target cells in the heart, kidneys, or other organs and systems, where they emit radiation that can attack or highlight tumors, diseases, or infections. Patients receive small enough doses that the radiation does them no harm, but because radioactivity deteriorates over time, radiopharmaceuticals must be made shortly before administration. Generally, a chemist will perform the necessary reactions at a lab bench, protected by a lead shield. But preparing some compounds—notably those used in the common form of medical imaging known as positron emission tomography, or PET scanning—involve reactions that can be cumbersome to perform manually given the need for appropriate lead shielding.

First developed about twenty years ago, ASUs use robotic technology to perform these reactions, which allows for better protection of human workers. But because the machines are so expensive, they're still not widely available, and even the priciest ones have a narrow range of capabilities; most existing units make only one commonly used radiopharmaceutical, a radioactive version of the sugar glucose that is taken up by cancer cells and used in imaging tumors.

Babich and his colleagues use many different radiopharmaceuticals in research, and they recently set out to see whether they could make smaller, cheaper ASUs to create them. The three began by designing machines using drafting software, then headed to the

3D Printing Core Facility in the Clinical and Translational Science Center (CTSC) at WCM. First, they printed a simple, toaster-sized plastic box, outfitted with off-the-shelf electronics, that synthesized carbon-11 labeled fatty acids—radiopharmaceuticals that include a radioactive form of carbon, which are commonly used to observe the heart as well as cancer cells.

After proving that it could be done, the team moved on to increasingly complex devices, eventually printing heat-resistant components in porcelain. Their second 3D-printed ASU synthesized a radioactive compound used to diagnose prostate cancer, and the next was designed to create different compounds that incorporate gallium-68, another radiopharmaceutical used in cancer detection. In addition to being cheaper to build than commercially available ASUs, the gallium-68 machine cut the time needed to synthesize a dose from fifteen minutes to five.

Babich, Kelly, and Amor-Coarasa published their work—which was funded in part by the CTSC through a cooperative agreement awarded by the National Center for Advancing Translational

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**The team's technology could potentially make more radiopharmaceuticals available in the developing world, as well as in smaller regional hospitals in the U.S. and Europe.**

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Sciences—in *Science Advances* in fall 2019; as the paper noted, yields and purity levels for their machines were generally comparable to manual synthesis and better than commercial units. While some of their ASUs are already being put to use in Babich's lab for research purposes, the team is also exploring how its devices can be widely produced to benefit patients. Colleagues at conferences have expressed interest, Babich says, and the WCM team is considering starting a company to produce their simple and affordable ASUs.

While advanced nuclear medicine is currently limited to major medical centers in only the wealthiest countries, the team's technology—which allows the machines to be built at a cost ranging from \$1,200 to \$7,000—could potentially make more radiopharmaceuticals available in the developing world, as well as in smaller regional hospitals in the U.S. and Europe. "We're hoping that this allows nuclear medicine technology to spread to places that would otherwise be hampered by cost alone," Babich says. "A lot of physicians can't do the things we do at Weill Cornell, but they still have patients who are ill. If there were a way for them to get this technology, they'd love to do it. They just need a way to make it happen." ■

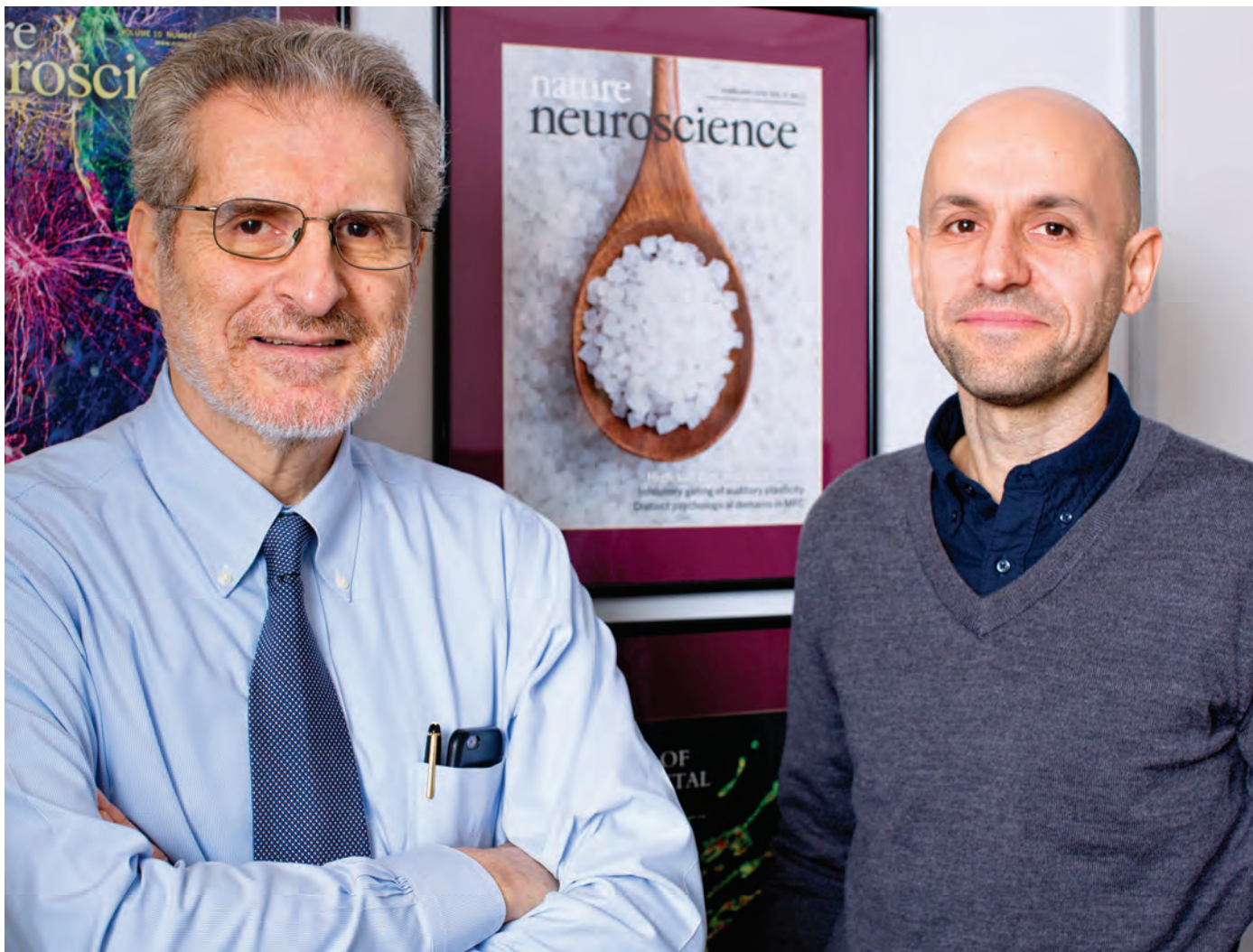
— Amy Crawford

*Dr. John Babich is the founder, with an equity stock interest, of Noria Therapeutics Inc., a radiotherapy company developing targeted therapeutic and imaging radiopharmaceuticals (alpha-emitting) for use in oncology. He is the inventor of various patents that have been licensed to Noria. He also has an equity stock interest in Ground Fluor Pharmaceuticals, Inc., a biomedical company developing proprietary new chemistry for the synthesis of pharmaceutical compounds for positron emitting tomography (PET) imaging.*



## Salt Sense

Scientists at the Feil Family Brain and Mind Research Institute investigate the link between a high-sodium diet and dementia



Costantino Iadecola, MD (left) and Giuseppe Faraco, MD, PhD

**O**n its face, the logic seems straightforward. Eating too much salt can lead to high blood pressure; numerous studies have shown that having hypertension in midlife makes it more likely that you'll develop certain forms of dementia, including Alzheimer's disease, in later years. Therefore, overly high sodium intake puts some people at risk of future cognitive impairment.

According to work by investigators in the Feil Family Brain and Mind Research Institute (BMRI) at Weill Cornell Medicine, that last statement is essentially true—but the issue is much more complex and nuanced than it might seem. In a study published in *Nature* in fall 2019, lead author Giuseppe Faraco, MD, PhD, assistant professor of neuroscience, and colleagues explored how excessive salt

consumption negatively impacts cognitive function. And according to their findings, that damage occurs independently of any increase in blood pressure—potentially offering other targets in the battle against dementia, an ever-rising concern as the population ages.

Working in a mouse model, the team found that consuming high levels of sodium causes a deficiency of the compound nitric oxide, which is vital in maintaining the brain's vascular health. Low nitric oxide levels destabilize the tau protein, whose accumulation in the brain is a hallmark of Alzheimer's disease. "If we block tau by injecting the mice with anti-tau antibodies, or in mice who have no tau [due to genetic engineering for experimental purposes], a high-salt diet is not able to induce cognitive impairment," explains Faraco,

PHOTOS: THIS PAGE, ABBOTT; OPPOSITE, PROVIDED



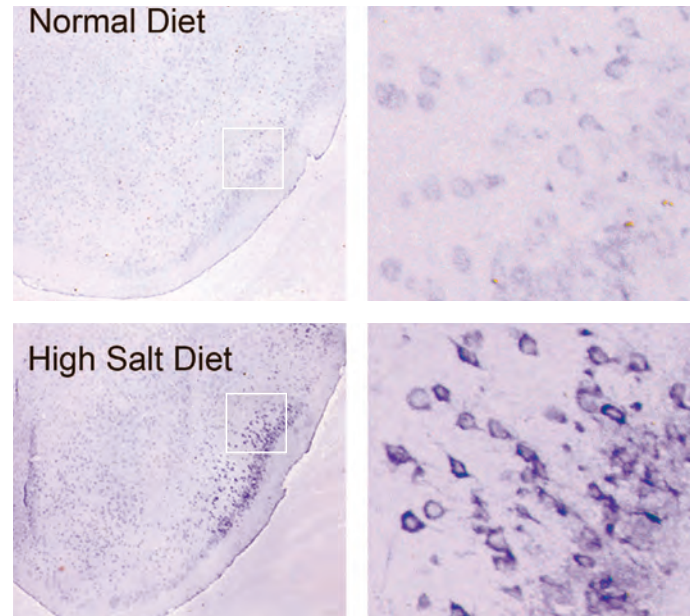
also a Finbar and Marianne Kenny Research Scholar in Neurology. “And this is interesting, because in the same mice we see that there is cerebrovascular dysfunction—the vessels of the brain don’t work properly. But despite this, because these mice don’t have tau or tau is blocked, there is no cognitive impairment. So there are other mechanisms involved.”

The research follows up on work the team published in *Nature Neuroscience* in 2018, which established that a high-salt diet causes dementia in mice—evidenced by the fact that the rodents couldn’t complete routine tasks like building their nests and had trouble with tests of memory, such as recognizing objects they’d seen before. The researchers determined that the high sodium consumption caused cells in the gut to release the molecule interleukin-17 (IL-17), which then entered the bloodstream and prevented cells in the walls of the brain’s blood vessels (known as endothelial cells) from producing nitric oxide, restricting blood flow. But that restriction, they realized, wasn’t severe enough to impair neurological function—prompting them to dig deeper and to tease out the relationship to tau.

Costantino Iadecola, MD, director of the Feil Family BMRI and the Anne Parrish Titzell Professor of Neurology, was senior author on the two studies. As he notes, the findings are important for multiple reasons. “It links something that you eat, a dietary factor—which is used and abused extensively throughout the world—to the signature of a neurodegenerative disease, which is the tau accumulation,” he says. “So having a link between salt and a dementing condition that is pervasive and increasing in impact is very, very important. It doesn’t mean salt causes Alzheimer’s disease, but it certainly provides a biological possibility that if you eat too much you may get an increased likelihood of developing it.”

Additionally, Iadecola says, the work underscores the role that overall brain health plays in staving off cognitive impairment—something that he and WCM colleagues have been at the forefront of exploring for more than a decade. “It’s important as a conceptual idea, that when you have a disease like Alzheimer’s, it’s not just the neurons—the king of the brain, the main cell—that are important,” says Iadecola, who was also senior author on a study, published in *Nature Neuroscience* in August 2020, that demonstrated that tau on its own can cause dysfunction of blood vessels in the brain, even without salt as a complicating factor. “It’s also the support cells that provide all the necessary nutrients and growth factors and help maintain the balance between the different molecules and biochemicals in the brain.”

Ultimately, Iadecola says, it will be essential to establish whether the findings in mice are also true in humans. But given that the neurological effects of a high-salt diet may not manifest themselves until decades after that sodium was overconsumed, such work would likely entail long-term, longitudinal population studies. “Over time,” he says, “you’re going to get an answer.” In the meantime, though, the team’s findings open up potential targets for future treatments, including drugs to increase the ability of endothelial cells to make nitric oxide or to target the immune response in the gut that leads



**FOOD FOR THOUGHT:** Tau phosphorylation (depicted in purple), a pathological hallmark of Alzheimer’s disease, as seen in the brains of mice fed a normal diet (top row) and one high in sodium. The square areas within the images on the left are magnified in the right-hand images.

to the release of IL-17. “If we can reduce salt intake to the appropriate levels for each individual, are we going to eliminate the problem of dementia? The answer is no,” Iadecola observes. “This is just one piece of the puzzle; other elements include exercise, genetics, and your levels of intellectual engagement and social interaction. It’s a mosaic of different factors, and any strategy to reduce the risk worldwide has to be multidisciplinary and multipronged.”

According to the Centers for Disease Control and Prevention, Americans should consume less than 2,300 milligrams of sodium

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**‘This is just one piece of the puzzle,’ Iadecola says of salt and Alzheimer’s. ‘It’s a mosaic of different factors.’**

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per day—but the vast majority of us eat far more than we should, for an average of more than 3,400 milligrams daily. (More than 70 percent of that intake comes not from the salt you sprinkle on your plate, but from processed food and restaurant meals.) And as Faraco notes, even as researchers further explore the link between salt and dementia, there’s no downside—and plenty of advantages, like lowering your risk of hypertension, heart disease, and stroke—to keeping your sodium intake within recommended guidelines. “That is a good practice independent of these papers,” he says. “A diet reduced in salt consumption is good for your health.” ■

— Beth Saulnier

Iadecola serves on the advisory board of Broadview Ventures.





# JUSTICE FOR ALL

## WCM redoubles its efforts toward racial equity in medicine —for the benefit of clinicians, patients, and society

BY HEATHER SALERNO

ILLUSTRATION BY JON KRAUSE

PORTRAITS BY JOHN ABBOTT

Like so many others across America and beyond, second-year medical student Chimsom Orakwue was outraged by the harrowing footage that captured the last moments of George Floyd's life, as a white Minneapolis police officer knelt on his neck for nearly nine minutes during an arrest late last spring. Something about the protests in the wake of Floyd's death felt different from the demonstrations against police brutality that Orakwue had marched in before. This time, the widespread civil unrest seemed to spark a deeper conversation about systemic racism in the United States and around the world, and she felt compelled to rally her classmates and colleagues at Weill Cornell Medicine.

As president of WCM's chapter of the Student National Medical Association, an organization dedicated to the needs of medical students of color, Orakwue helped coordinate a student-run virtual town hall last spring with fellow second-year Mercy Ude, who leads WCM's chapter of White Coats for Black Lives. It was intended to pay homage to individuals who have lost their lives to police brutality, but also allowed the Weill Cornell community to share their experiences as people of color. They were joined by more than 200 students, trainees, faculty, and staff, some of whom told emotional stories about injustices they've faced or witnessed, and emphasized the importance of making healthcare anti-racist. Activists argue that there's a difference between being "not racist" and "anti-racist"—the latter denoting an active, conscious process of identifying and eliminating racism by changing policies and attitudes, acknowledging personal privilege, and confronting acts of discrimination and inequality. "It was a pivotal moment and eye-opening for a lot of people," recalls Orakwue, who was born in Nigeria and moved to the U.S. as a young child with her family. "I think because it was an unprecedented

time with the spread of the coronavirus, people were forced to slow down and weren't as distracted by other things. That allowed them to really listen and hear the hurt, and take a closer look at what was happening."

Meanwhile, WCM leadership was mobilizing to address these issues. The institution has long been a leader in its commitment to diversity and inclusion; it recently won, for the third year in a row, the Health Professions Higher Education Excellence in Diversity Award from *INSIGHT Into Diversity* magazine, the largest and oldest diversity-focused publication in higher education, and last year it launched a pioneering debt-relief program to make medical school more accessible to aspiring doctors who might not otherwise envision medicine as a career they could afford to pursue. Yet ongoing discussions made it clear that additional change was urgently needed. Weekly virtual town halls hosted by the Office of Diversity and Inclusion throughout the spring—some of which drew up to 1,000 people—were initially begun to talk about the COVID-19 pandemic's disproportionate impact on low-income communities and those of color, but quickly developed into a broader dialogue about inequality. The response to the student-led town hall also prompted a group of WCM's medical students of color to submit a formal letter listing steps the administration could take to further social justice and confront racism on campus, while students in the Weill Cornell Graduate School of Medical Sciences called for similar action.

"This moment has provided Weill Cornell Medicine and our country with a unique opportunity," says Augustine M.K. Choi, MD, the Stephen and Suzanne Weiss Dean of Weill Cornell Medicine and provost for medical affairs at Cornell University. "The disproportionate effects of COVID-19 on ▶



Said Ibrahim, MD

Black and brown people and the Black Lives Matter demonstrations last summer have opened Americans' eyes to how entrenched racism is in the very structures and institutions of our society, and to the critical urgency to dismantle it if we are to become the equitable and just nation we imagine ourselves to be. We must use the momentum of the past year to actively work against racism, including its effects on the STEM workforce and the disparate health of our diverse communities."

### **Taking Swift Action**

By June, Choi had announced immediate actions to ensure greater equity across WCM such as mandatory annual anti-bias training for all employees; the establishment of a committee at the graduate school that would look into instances of student mistreatment, including incidents of racial discrimination and microaggressions; and the appointment of "diversity champions" in every academic department to help develop plans to recruit, promote, and retain underrepresented faculty and trainees. Since then progress has been made on a number of other fronts, including: changes to the medical school curriculum that introduce more content related to racism and social injustice and their connections to healthcare access and outcomes; increased support to pipeline programs to intensify outreach to students of color; and the creation of the Office of Institutional Equity, which is charged with investigating reports of discrimination and harassment and enhancing fairness in employment practices.

Said Ibrahim, MD, WCM's senior associate dean for diversity and inclusion, says that addressing these issues isn't only about righting past wrongs; it's also about improving public health. He notes that there's a growing body of evidence that patients generally fare better when they're cared for by clinicians from diverse backgrounds. "Diversity and inclusion isn't just important because it's morally the right thing to do," says Ibrahim, who grew up in Somalia as one of ten children and came to America in the mid-1980s to pursue his education. "Different backgrounds, experiences, and perspectives make scientific teams better because they approach problems from many angles—and medicine and science have become team sports."

At WCM, such efforts to address inequity are longstanding. The civil rights movement prompted the medical school to introduce new strategies to increase enrollment of Black and brown people, including a summer research program for undergraduates that was launched in 1969 as a way to give underrepresented students the experience needed to become



competitive medical school applicants. Until then, only about a dozen Black people (including African Americans and international students) had graduated as doctors from the medical school since its founding in 1898, according to the 2016 book *Weill Cornell Medicine: A History of Cornell's Medical School* by Dean Emeritus Antonio M. Gotto Jr., MD, and Jennifer Moon, PhD. Each year the initiative—now known as the Travelers Summer Research Fellowship Program—offers twenty-five college students from underserved racial and ethnic groups or socioeconomically disadvantaged backgrounds the opportunity to work in laboratories, attend lectures, shadow physicians, and gain deeper insight into the field of medicine. Since its launch, Travelers has trained more than 1,200 undergraduates from across the country; according to the most recent statistics (from 2018), nearly 83 percent of them went on to medical school.

Cardiologist Jessica Peña, MD '03, assistant professor of medicine and assistant dean for admissions, knows firsthand how transformative pipeline

**'Different backgrounds, experiences, and perspectives make scientific teams better,' says Said Ibrahim, MD.**

programs like this can be for young people of color. As a Latina high school student in Brooklyn, she participated in WCM's Health Professions Recruitment and Exposure Program (HPREP), which gives students from underrepresented groups the opportunity to meet and learn from physicians and other healthcare professionals. Running for ten weeks from January to March, the program started on campus in 1989 and has since been adopted at medical schools nationwide. "I was interested in science, but hadn't really thought seriously about becoming a doctor until I saw so many medical students who were so encouraging and inspirational," says Peña, who also took part in Travelers as a Brown University undergraduate. "It was the first time I saw people who look like me doing the same kinds of things I was interested in."

Joy Howell, MD—an associate professor of clinical pediatrics who oversees student service learning, health equity community efforts, and other initiatives as assistant dean for diversity and student life—says programs like Travelers are as important now as they've ever been. Currently, less than >



Joy Howell, MD



Kevin Holcomb, MD

10 percent of practicing U.S. physicians are from groups underrepresented in medicine, yet racial and ethnic minorities will account for more than half of the nation's population by 2050. Howell says it's critical to increase this number, because when a patient can't find providers who resemble them or identify with their cultural beliefs, it can threaten or compromise care in communities whose members already face higher rates of chronic disease and premature death. Studies show that when patients are of the same race as their physician, they report higher levels of trust and satisfaction and are more likely to observe healthcare recommendations. Says Howell: "We have to provide that exposure to underrepresented young people if we want to generate a workforce that more closely matches the demography of America."

To amplify that outreach to racial and ethnic minorities, WCM has committed to increasing

**Part of WCM's increased focus on racial justice involves a shift in its approach to educating its future physicians.**

financial backing of campus organizations that support specific groups, such as the Black and Latino Men in Medicine Initiative (BLMiM). Over the last thirty years, there has been a significant decline in medical school matriculation among Black and Hispanic men, with a lack of exposure to medicine and a lack of accessible mentors cited as possible reasons for the drop. "Black and Hispanic males in medicine are almost an endangered species," says Kevin Holcomb, MD, the medical school's associate dean of admissions, who is Black and serves as the BLMiM faculty adviser. "It's the most underrepresented group among underrepresented minorities." The organization began in 2016 to advance Black and Latino male faculty, trainees, and students at WCM and its affiliated institutions, and it also runs the Science and Leadership in Medicine Mentoring Program for high school and college students. "Mentorship is an essential component to professional and career development," says Holcomb, director of the Division of Gynecologic Oncology and an associate professor of clinical obstetrics and gynecology. "Interacting with just one person can totally change your worldview."



### A Push for Meaningful Change

Part of WCM's increased focus on racial justice involves a shift in its approach to educating its future physicians, with Yoon Kang, MD, senior associate dean for education, leading the newly established Equity and Inclusion Initiative in collaboration with the student-led Anti-Racism Task Force. Kang says one area that's often overlooked when it comes to inclusion is financial parity—which is one reason why WCM started a scholarship program last year to eliminate medical education debt for students with financial need, who are more likely to be racial and ethnic minorities. To extend that commitment to economic equity, starting this academic year WCM will cover for all students the costs of study materials and registration for the first two in a series of U.S. Medical Licensing Examinations that students are required to pass before they can practice medicine. Such tests are pricey: the cumulative fees for these two exams are more than \$1,200. WCM is now also looking at increasing opportunities for underrepresented students to attend conferences, networking events, and other activities that can boost one's career but are often expensive. "There are many hidden costs of medical school that aren't necessarily something you think of when you're pursuing your dream of becoming a doctor," says Kang, also the Richard P. Cohen, MD, Associate Professor of Medical Education. "We want to level the playing field when it comes to academic success and professional development for all students."

WCM is also working to reframe the current medical curriculum so it addresses the historical impact of racism on healthcare disparities among patients of color; a new subunit on social justice, policy, and advocacy has already been integrated into the Essential Principles of Medicine Course for first-years. Monika Safford, MD '86, founder and co-director of the Cornell Center for Health Equity—who for decades has studied inequalities in the provision of medical care among racial, ethnic, and socioeconomic groups—says that eliminating long-standing practices that reflect systemic bias is imperative to prevent people of color from being disregarded or misdiagnosed. For example, Safford points to a widely used test that adjusts for race when assessing a waste product called creatinine (a measure of kidney function) because the doctors who created the formula presumed Blacks generated more creatinine than patients of other races; more recent studies have found that creatinine levels fluctuate in adults regardless of race or ethnicity. Continued use of that test, Safford argues, can stall life-saving treatment for many Black patients with kidney disease.▶



Chimsom  
Orakwue '23



Mercy Ude '23



W. Marcus Lambert,  
PhD, MS '18

“We have to show how pervasive these practices are throughout medicine,” says Safford, also the John J. Kuiper Professor of Medicine. “And the only way to do that is to make teaching about these root causes of healthcare disparities pervasive throughout the medical education curriculum.”

Safford adds that future MDs need to have a deeper understanding of how social determinants of health—such as access to education, housing, jobs, and healthy food—contribute to widespread health disparities. COVID-19 has only served to underscore these existing inequities, with Blacks

**‘Once you get people here, you have to make sure they feel as if they belong and are included,’ says Jamal Lopez, JD.**

and Latinos dying far more frequently than their white counterparts. After creating a registry with information from over 4,000 COVID patients seen at New York City hospitals, Safford and her colleagues are now involved with more than fifty studies using the data—some of which are examining the effect that social determinants (like neighborhood overcrowding) have on the infection rate and mortality by race and ethnicity. “What we’ve been saying for a long time is now falling on receptive ears,” she says.

“We’re recognizing that the impact of these determinants on health outcomes can overshadow our medical interventions. More and more physicians are motivated to become more vocal advocates for eliminating or stemming these social influences on our patients’ health.”

#### **A Renewed Culture of Belonging**

Meanwhile, at the graduate school efforts are under way to make the learning environment more welcoming to people from diverse backgrounds. All faculty and students are now required to undergo training on eliminating unconscious bias through a module that focuses on shared values and expectations in the WCM community. Last summer’s protests also prompted the school to boost awareness of its Trainer-Learner Committee, which encourages students to report instances of mistreatment, such as behavior that disparages a student’s gender, religion, race, or culture. “One of the biggest things we need in order for change to occur is the infrastructure to support it,” says W. Marcus Lambert, PhD, MS ’18, the graduate school’s assistant dean of diversity and student life and an assistant professor of education research in medicine, who will be joining SUNY Downstate as the associate vice president for research strategy and operations and an associate professor in the Department of Epidemiology and Biostatistics in the School of Public Health on April 1. “This is going to be a lasting effort.”

Similarly, Jamal Lopez, JD, was charged with



leading WCM's newly created Office of Institutional Equity—in part to establish an investigatory body, separate from Human Resources, that examines claims of discrimination and harassment across the institution. All WCM employees are required to take an unconscious bias webinar created by the office, which also plans to release resources on topics like resiliency (how to thrive and overcome obstacles) and allyship (how to build relationships based on trust and accountability with marginalized groups), in the hope of making a more practical impact on the careers of those who are underrepresented in medicine and to underscore the myriad ways by which everyone can work to combat racism. “We’re already a diverse institution—that’s the first step,” says Lopez, who is senior director of institutional equity. “But once you get people here, you have to make sure they feel as if they belong and are included when it comes to opportunities.”

Ibrahim says the institution is taking a harder look at diversity among its faculty, too. While roughly 30 percent of students in WCM's medical and graduate schools are racial or ethnic minorities, only about 4 percent of the faculty in its basic sciences departments, for instance, are from underrepresented groups. With diversity champions appointed to aid each academic chair, Ibrahim believes the implementation of plans to retain and support talented physicians and scientists of color will accelerate. “We’re also brainstorming ways to recruit more underrepresented faculty to our institution,” he says.

Chris Bourne, a fourth-year doctoral candidate in cancer immunology who is Black, agrees that boosting the number of underrepresented groups in leadership roles at WCM is key to growing a diverse medical and scientific workforce. He wants to stay in academic medicine, with the goal of running his own laboratory someday. But Bourne, who is co-chair of the graduate school's Social Justice and Anti-Racism Task Force, says this dream is sometimes difficult to envision when there are so few role models in his field. “That’s been a major challenge,” he says. “You can’t be what you can’t see. Visibility is very important.”

As for Orakwue, she’s encouraged by how much progress WCM has made in only a few months. She hopes the momentum will continue, and that the institution will push forward with its redoubled commitment to the cause. “While there is still so much to be done because this is such a huge problem to tackle, I’m excited to see what comes next,” she says. “Weill Cornell has shown that this is an issue worth fighting for.” ■



Jessica Peña,  
MD '03



Kristen Marks, MD,  
MS '09



# MISSION: POSSIBLE

Weill Cornell Medicine launches an unprecedented research effort in the battle against COVID-19

By Elaine Meyer

Photos by John Abbott

Soon after the first case of COVID-19 was reported in New York City in early March, a group of about ten physician-scientists at Weill Cornell Medicine met to discuss a pressing issue: there were no known treatments for severe cases of the disease. At the time, such cases had a dangerously high chance—around 25 to 40 percent—of leading to death or to lasting complications like severe lung damage. At the meeting, the enormity and the urgency of the situation came into stark focus. The infectious disease specialists anticipated that WCM, and New York City, could face the same situation as had overwhelmed hospitals in northern Italy—though they didn't expect that it would happen as quickly as it did. To prevent death on a scale previously unimaginable in their medical careers, they began to discuss how they could acquire and study—as soon as possible—treatments for a virus the world was just beginning to understand.

Normally, clinical research on therapeutics takes years. But SARS-CoV-2, the virus that causes COVID-19, wouldn't allow for this kind of timeline. As the number of patients hospitalized with the virus at NewYork-Presbyterian/Weill Cornell Medical

Center shot up in early March, WCM became a research hub for the rigorous investigation of COVID treatments and, later, two top vaccine candidates.

Results from those studies have contributed to a growing body of knowledge from around the world that has improved the care doctors can provide—in some cases enabling them to prevent or reduce the severity of disease and even the percentage of patients who die of COVID. Additionally, strong early results reported from the Moderna vaccine trial, in which WCM participated, along with the trial of a vaccine by BioNTech and Pfizer, may pave the way to the eventual end of this global health crisis. “To do clinical trials in the middle of a pandemic was just extraordinary,” says Roy Gulick, MD, chief of the Division of Infectious Diseases and the Rochelle Belfer Professor in Medicine at WCM and an attending physician at NewYork-Presbyterian/Weill Cornell. “You had a swell of very ill people with a highly contagious disease whose infectivity and typical clinical course we didn't yet know. At the same time, while critically ill people often will want to try anything, including investigational drugs, to get better, they

usually want to talk over participation in a clinical trial with their families and friends—and providers want to have comprehensive discussions with their patients about participating. So this was a really challenging environment.”

## IN RECORD TIME

Soon after the infectious disease faculty met, twelve experts in areas ranging from rheumatology to pulmonology reviewed more than seventy ideas for potential treatments from across the medical center. The group—dubbed the COVID-19 Clinical Trials Task Force—prioritized studies that were scientifically sound and compelling, either government-sponsored or initiated by WCM investigators, and not too duplicative of studies elsewhere. “There's a reason that we conduct rigorous scientific research, and it's because you don't know at first blush how effective an agent will be,” says Rainu Kaushal, MD, senior associate dean of clinical research, who is also the Nanette Laitman Distinguished Professor of Population Health Sciences and chair of the department. “At Weill Cornell, we believe in the process of science; we're leaders in the process of science, and >



**VITAL CONTRIBUTION:** Retired nurse Rose Strickland (left) has a blood sample taken as part of the Moderna vaccine study, for which she volunteered.

COVID is an example of that. The work we have done demonstrates the strength of our expertise in clinical care delivery, clinical trial development, and deployment in population and health services research.”

The task force was especially hopeful early on about two drugs, remdesivir and hydroxychloroquine, which had performed well in laboratory studies by blocking steps in the life cycle of SARS-CoV-2. Remdesivir had also showed activity against the coronaviruses that cause Severe Acute Respiratory Syndrome (SARS) and the Middle Eastern Respiratory Disease (MERS) and had proven safe, though not effective, in clinical trials of Ebola patients. Hydroxychloroquine was already approved by the Food and Drug Administration to treat lupus and rheumatoid arthritis and so was readily available.

But given that SARS-CoV-2 was a new virus, there was no evidence as to whether either drug would be effective in humans; this would require studying it in patients, and not just a lab. “One lesson COVID has reinforced

is that a lot of things work in test tubes. But that doesn’t necessarily mean they’re going to cure someone or be effective in treatment,” says Kristen Marks, MD, MS ’09, an associate professor of medicine in the Division of Infectious Diseases at WCM and assistant attending physician at NewYork-Presbyterian/Weill Cornell, who led studies of remdesivir and is now leading the medical center’s vaccine trials.

To get these studies up and running at “hyper speed,” faculty and staff made enormous pushes, says Gulick. Research teams that ran clinical trials on HIV, transplant oncology, and other infectious diseases were shifted to the COVID trials. Some were housed in hotels near the medical center so they could be close to work while they drafted research protocols that would be evaluated by WCM’s Institutional Review Board (IRB), and because at the time there were concerns they might expose their families to the virus. “That showed enormous dedication, staying in hotels for weeks at a time, working seven



days a week; it was an incredible team effort,” says Marshall Glesby, MD, PhD, a professor of medicine and of population health sciences at WCM and an attending physician at NewYork-Presbyterian/Weill Cornell who ran trials of some of the experimental treatments. WCM’s IRB and contracts office also worked at rapid speed, approving the protocols and contracts for the studies less than a week after submission.

As the researchers note, enrolling patients was more challenging than in a typical clinical trial. Early on, remdesivir supplies were limited because the drug wasn’t yet FDA approved, restricting how many patients could enroll. As part of informed consent requirements, research staff also had to explain to potential participants that they did not know whether the therapies would work—a particularly harrowing reality given the rapid deterioration of some COVID patients—but that was a risk that many were willing to take, Marks says.

The process was complicated even more because, to limit exposure, patients’ families couldn’t be in the same room to discuss options with doctors. In some cases, patients were close to being put on a ventilator or were already sedated, requiring a relative to authorize the patient’s participation in the study. Though in-person consent is normally required, families were able to give “e-consent” over videoconference, phone, or chat technology. “I spent a lot of time having people call their loved ones, to help them reach who they needed to, so they could feel good about the decisions they were making,” Marks says. “Often it was a very time-pressed situation. I had people from whom I would go in to get consent, and they would literally be intubated an hour later, sometimes minutes later. I was incredibly moved by the bravery of the people who were willing to participate in research at a critical time.”

The study of remdesivir, published in the *New England Journal of Medicine* in early November by Marks and co-authors from around the world, reported that about 400 patients showed clinical improvement on either five or ten days of treatment. The FDA used this and other studies to approve remdesivir in October as the first drug to treat COVID. The World Health Organization recently cast doubt on remdesivir’s effectiveness given its lack of mortality benefit and its cost, but the FDA and other scientists believe,

based on the data, that the drug can speed recovery from the illness—an important clinical goal.

Other experimental treatments proved less successful. WCM investigators stopped their trial of hydroxychloroquine after evidence emerged from other hospitals that it wasn’t working. Investigators found in another study that sarilumab, an immunomodulator that had initially seemed promising, wasn’t effective for patients with severe illness—the population in which it was tested—and the treatment was stopped.

Of course, the fact that some treatments may prove ineffective is a risk of participating in clinical trials. During an unprecedented pandemic like COVID, when so many unknown treatments are being tested at the same time, researchers have used what is called an “adaptive” trial design so patients

**‘One lesson COVID has reinforced is that a lot of things work in test tubes,’ says Kristin Marks, MD, MS ‘09. ‘But that doesn’t necessarily mean they’re going to cure someone or be effective in treatment.’**

can be switched to more effective options if they become available during a study. When it’s clear a therapy is ineffective, patients are immediately switched off, as was the case in the sarilumab study. “It’s important to know that a particular drug is not going to be a viable approach,” says Glesby, who ran the sarilumab trial and recently led a trial of convalescent plasma that was stopped early after the research showed it was unlikely to benefit patients. “Not only to physicians, but to patients and their families.”

#### QUEST FOR A VACCINE

NewYork-Presbyterian/Weill Cornell is the only medical center in New York City participating in the trial of the Moderna vaccine, which enrolled over 30,000 participants across the U.S. and whose early results were much stronger than anticipated. In

November, Moderna, which developed the vaccine in partnership with the National Institutes of Health (NIH), announced it is 94.1 percent effective in preventing COVID-19 illness, and the FDA authorized its emergency use in December. Among those who received two injections, only eleven participants were infected with COVID, compared to 185 in the group that received the matching placebo, according to data published in the *New England Journal of Medicine* in December. This is significantly more effective than the 30 to 60 percent risk reduction of a typical flu vaccine. Though new SARS-CoV-2 variants have emerged that could eventually challenge the efficacy of vaccines, many public health experts believe the distribution of the Moderna vaccine, and a similarly successful vaccine by Pfizer and BioNTech, will allow societies to control and possibly end the pandemic.

These enormous stakes are what drove Rose Strickland, an eighty-one-year-old retired nurse, to volunteer to participate in the Moderna study. “We are in the midst of the worst pandemic of my lifetime. The only way we will be able to find some answers and possibly a treatment is by trying to determine measures to address the problem,” the Brooklyn resident says. “I feel we owe it to our frontline healthcare workers and scientists to do everything within our power to assist them in their efforts to maintain our health and wellbeing.”

Until now, the mumps vaccine held the speed record for development and approval: four years. Normally, it takes months just to test a vaccine’s biological mechanism and safety—two stages required before testing it on patients to see if it prevents infection and illness. Once participants are enrolled, they are randomly assigned to a group that receives the vaccine or to one that receives either a placebo or the current standard treatment. Even after efficacy data becomes available, investigators continue to monitor participants to determine how long the vaccine’s protection might last and whether they experience side effects.

For the Moderna study, WCM was determined to enroll a diverse population, given that the virus has disproportionately impacted the elderly, Blacks, and Latinos. This includes Strickland, who is Black and has hypertension. “I felt very strongly about contributing to ensure that participants are >

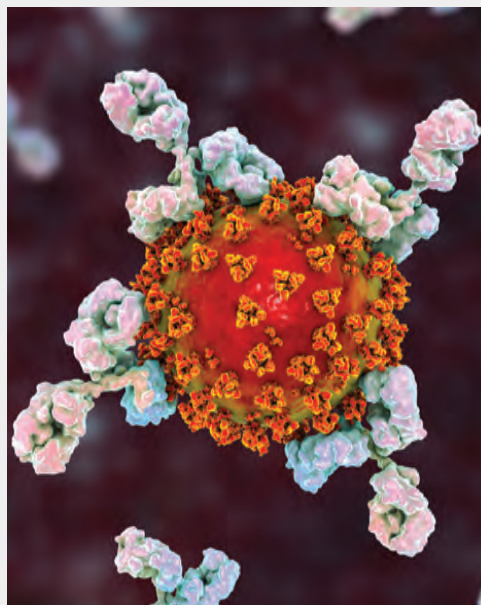
## The Outlook for COVID Care

Treatments target disease on a variety of fronts

There are now a small but growing number of treatments for COVID-19 in hospitalized patients, including remdesivir in the virus's earlier phase and dexamethasone and other corticosteroids in its later phase. But with the virus still raging in early 2021 and continued COVID-related deaths in the U.S. and many other countries, there is a need for strategies that can keep patients from getting sick enough to be hospitalized and reduce overall infection rates.

Teresa Evering, MD '97, is running WCM's arm of the ACTIV-2 study, a multicenter trial conducted by the AIDS Clinical Trials Group and sponsored by the NIH. ACTIV-2, which will investigate multiple agents, began with the study of Eli Lilly's monoclonal antibody treatment, bamlanivimab. This investigational therapy involves cloning the most potent antibodies of people who have recovered from COVID in a laboratory, then infusing them into an infected person to block the virus from entering a cell and making copies of itself. "The goal of ACTIV-2 is to identify safe outpatient therapeutics that decrease the severity of COVID-19 and also decrease the duration of infection and the ability to transmit," says Evering, an assistant professor of medicine at WCM and assistant attending physician at NewYork-Presbyterian/Weill Cornell. "We'd also like to see that they keep people from being hospitalized—and from dying."

Other strategies target the disease in the later phases characteristic of the most severe COVID cases. These patients typically develop an overreactive immune response to the virus, called a cytokine storm. Among many other complications, the reaction is linked to abnormal blood clotting—which can lead to strokes and to clots in the veins of the legs, arms, and lungs as well as the small pulmonary vessels, and can be fatal. Maria De Sancho, MD, MS '09, a professor of clinical medicine at WCM and a hematologist at NewYork-Presbyterian/Weill Cornell, is leading a clinical trial to determine what dose of anticoagulants (blood thinners) can be used to prevent excessive clotting and death in



**DEFENSE FORCE:** A conceptual illustration depicts antibodies attacking the SARS-CoV-2 virus.

**INCREASINGLY ACROSS THE U.S. AND EUROPE, THERE IS A NEED FOR STRATEGIES THAT CAN KEEP PATIENTS FROM GETTING SICK ENOUGH TO BE HOSPITALIZED AND REDUCE OVERALL INFECTION RATES.**

leading a study at Weill Bugando Medical College in Tanzania to identify the precise location of injury in the kidney and investigate whether it becomes a long-term health issue.

And WCM researchers are trying to understand how long patients are immune to SARS-CoV-2 after having COVID. While antibody tests can confirm whether someone was infected with the virus, it's not clear how strongly these antibodies confer immunity. Julie Magarian Blander, PhD, the Gladys and Roland Harriman Professor of Immunology in Medicine, is studying blood collected from WCM and NewYork-Presbyterian/Weill Cornell healthcare workers who recovered from COVID. She is trying to understand if people with a receptor on certain immune cells that find and destroy cells infected with SARS-CoV-2 are immune to future infection. If successful, scientists hope to develop a more precise alternative to an antibody test that identifies people who are immune based on the presence of these receptors.

these patients without increasing the risk of bleeding. She is also studying patient blood samples to understand the mechanisms of clotting in people hospitalized with COVID.

Other WCM researchers are investigating the long-term effects of COVID, which range from neurological complications to organ damage, and are some of the most troubling and mysterious aspects of the disease. Alexander Merkler, MD, MS '20, an assistant professor of neuroscience and of neurology at WCM and an assistant attending neurologist at NewYork-Presbyterian/Weill Cornell, and Babak Navi, MD, MS '15, an associate professor of neuroscience and of neurology at WCM, are leading a multi-site study to identify common risk factors for stroke in patients hospitalized for COVID. They hope to use the results to develop methods including a machine-learning algorithm that can help healthcare staff identify patients at high risk for stroke. Because half of patients who have had COVID show some kind of kidney damage, Robert Peck, MD, associate professor of medicine and of pediatrics, is

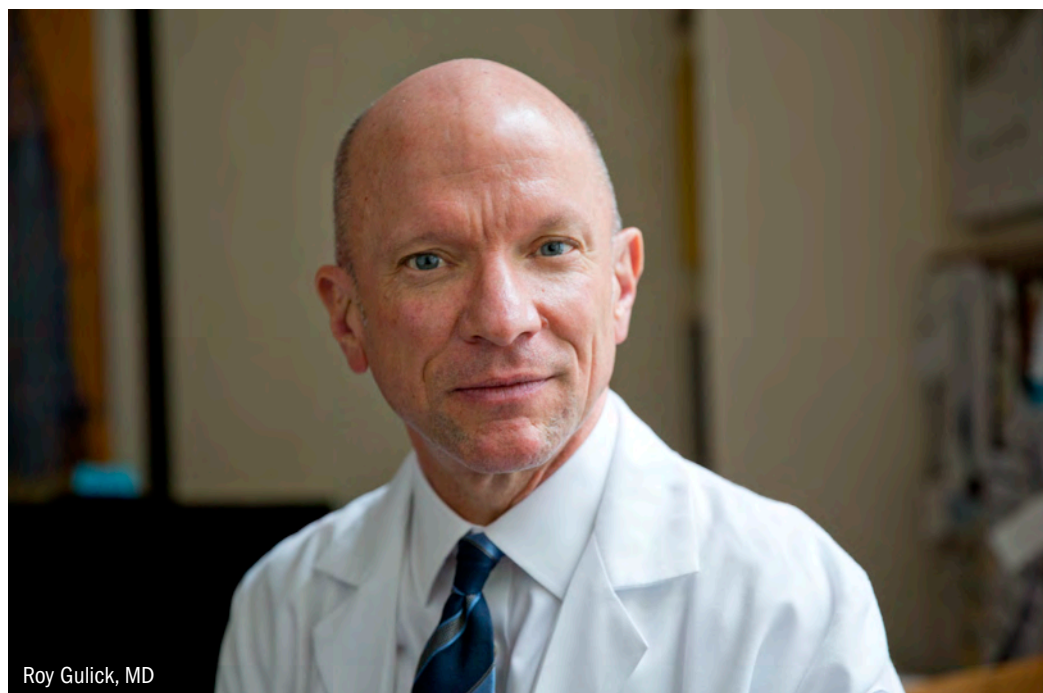


representative of the population,” she says. “My position is, I must participate because if I and others like me do not, we will have no assurance that when a vaccine is developed it will be as safe and effective for us as it is for anyone else.”

WCM investigators were interested in joining Moderna’s trial because its vaccine (along with Pfizer and BioNTech’s) uses synthetic messenger RNA (mRNA), a fairly new strategy that has never before been employed in an approved vaccine. The vaccine consists of a piece of the genetic template of the virus (in the form of mRNA) that is injected and then read by human cells to make the spike protein of the SARS-CoV-2 virus. Since only the viral spike protein is made, the vaccine itself can’t cause COVID-19. The viral spike protein stimulates the human immune system to generate a response in the form of specific antibodies and cells, which then are capable of identifying and destroying the actual virus if someone is subsequently exposed to it. Because mRNA technology is relatively quick and inexpensive—and may be safer than traditional vaccines that use weak or dead virus material—its FDA approval for Emergency Use Authorization in December represented a scientific milestone.

WCM is also the site for a trial of a vaccine developed by Novavax that uses proteins from the SARS-CoV-2 virus; the trial started in late December and enrolled 30,000 participants at 115 sites across the continental U.S., Puerto Rico, and Mexico. According to several of the investigators involved, the NIH—which is coordinating many of the vaccine trials—chose WCM because of the medical center’s strong record for enrolling and managing clinical research as part of the AIDS Clinical Trials Group and the HIV Prevention Trials Network; both are initiatives of the National Institute of Allergy and Infectious Diseases (NIAID) and are working with other NIAID-funded clinical trials networks to test COVID-19 vaccines and treatments.

Although there have been concerns about the speed of vaccine approval, WCM faculty are adhering to rigorous standards of clinical research, just on an accelerated timeline. “No safety steps are being skipped,” says Marks, who is leading both of WCM’s vaccine trials. “What has changed to accelerate vaccine availability is that the phases of studies were overlapped and production of the vaccine



Roy Gulick, MD

**‘In clinical trials in the midst of a pandemic, literally anything can happen,’ says Roy Gulick, MD. ‘You have to be on your toes.’**

began immediately.” No one is deliberately exposed to the virus—that would entail a different type of study, known as a “challenge trial”—and participants are told to continue practicing social distancing and wearing masks.

As Gulick notes, one of the realities of research in the time of COVID is that new results and developments happen at break-neck speed. “In clinical trials in the midst of a pandemic, literally anything can happen,” he says. “You have to be on your toes.” Investigators are nonetheless starting to consider how they can take some of the adaptations they made in the pandemic’s frenetic early days and establish new approaches that will make clinical research more responsive not just to COVID but to future pandemics. For example, the use of electronic consent processes—which helped speed up trial enrollment—may become more routine.

The same goes for the use of adaptive study designs, in which investigators can switch patients from one experimental therapeutic to another (should a more promising option emerge) while still collecting clinically important data. Observes Timothy Wilkin, MD, assistant dean for clinical research compliance and a professor of medicine at WCM and an attending physician at NewYork-Presbyterian/Weill Cornell: “We need to evolve from a ‘wartime’ operation to having a long-term plan and establishing some normalcy for how we do research.”

The scale, speed, and severity of COVID, and the need to develop more treatments and vaccines, will continue to be an enormous test, even for clinical research infrastructures that have brought the rigor of modern science to controlling so many complicated and once deadly diseases. But, Kaushal says, at the end of a year of scientific discovery that was at times discouraging and at times politicized, this unprecedented clinical research effort is bearing fruit. “In response to a novel virus during a global pandemic, Weill Cornell Medicine brought together the scientific expertise of many specialties to test experimental therapies and translate the benefit to patients as swiftly as possible, sometimes in life-or-death cases. This is the kind of effort that is only possible at a collaborative and scientifically rigorous academic medical center.” ■

# Mind & Body

## From cognitive deficits to stroke, some COVID patients face serious neurological symptoms

BY AMY CRAWFORD

Last spring, as the COVID-19 pandemic hit New York City with full force, Daniel MacGowan, MD, a neurologist specializing in neuromuscular disease, was asked to consult in a COVID recovery ward. The forty patients there had all been intubated and sedated, many for weeks—and although they had cleared the infection they were still too weak to leave the hospital. In addition, some were also experiencing unusual neurological symptoms. Some suffered from “foot drop,” a problem with walking that is often a sign of nerve damage, recalls MacGowan, an assistant professor of clinical

coronavirus had damaged the blood vessels that supply the brachial plexus as well as the sciatic nerve, which travels the length of the leg. The resulting clotting disrupted blood flow, causing sections of the nerves—called fascicles—to be starved of oxygen, killing them. “It was surprising,” MacGowan says. “I’m not aware of other viruses that cause such widespread clotting.”

A year into the pandemic, WCM clinicians and researchers are still learning new things about SARS-CoV-2, the virus that causes COVID-19. But a scientific consensus has emerged that this respiratory virus can, in severe cases, cause damage throughout the body, including to the nervous system and the brain itself. WCM scientists are now working to investigate these effects—and to find better ways to prevent and treat them.

As Matthew Fink, MD, notes, SARS-CoV-2 is not the only virus that can cause nerve damage—but it does seem to cause more damage than most. “The cognitive symptoms that sometimes result from COVID are also somewhat of a mystery,” says Fink, the Louis and Gertrude Feil Professor and chairman of neurology at WCM and neurologist-in-chief at NewYork-Presbyterian/Weill Cornell. “And of course we were struck by the prevalence of serious strokes, which is much higher than we’ve seen in other viral diseases.”

Babak Navi, MD, MS ’15, chief of the Division of Stroke and Hospital Neurology at WCM and medical director of the Weill Cornell Stroke Center, treated a steady stream of COVID patients at the height of New York City’s epidemic last spring. He was familiar with the role that viruses can play in triggering strokes in patients who are already at risk, but SARS-CoV-2 appeared to be doing so at much greater rates. In fact, a study Navi and colleagues recently published in the journal *JAMA Neurology* showed that people who were hospitalized or visited the emergency department with COVID had a risk of stroke that was seven times that of similar patients with influenza. The reasons why remain an open

**‘We were struck by the prevalence of serious strokes, which is much higher than we’ve seen in other viral diseases,’ says neurology chair Matthew Fink, MD.**

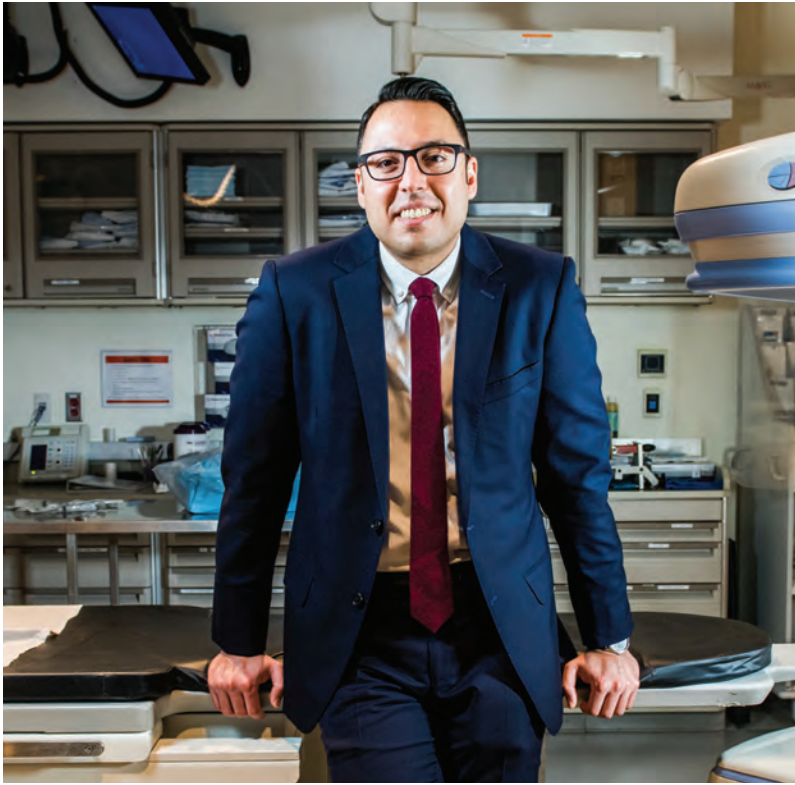
neurology at Weill Cornell Medicine and a neurologist at NewYork-Presbyterian/Weill Cornell. Others reported pain from nerve entrapment in their elbows or knees.

While the convalescent COVID patients’ complaints were different from what would normally be expected in people recovering from a respiratory ailment, some were likely attributable to the time they had spent immobilized in the ICU. But fourteen of the patients also presented with something that surprised the veteran neurologist. “They had severe weakness in muscles connected to nerves in the brachial plexus,” MacGowan says, referring to the cluster of nerves that control the muscles and communicate sensation in the shoulder, arm, and hand. “That would not be expected at all, and we assume it was due to the virus.”

MacGowan and his colleagues could not biopsy the brachial plexus because that would cause further damage, but MRIs and physical examinations revealed that some peripheral nerves were dying or dead. The team came to the conclusion that the







Babak Navi, MD, MS '15

question—one that WCM clinicians and researchers are continuing to investigate. “It’s not just one thing that leads to stroke in people with COVID,” Navi observes. “It has to do with increased inflammation as well as with COVID’s effects on blood vessels and the clotting system, on the heart and other organs, and in causing organ failure in very

### **Even patients who don’t experience acute events like stroke sometimes display unusual neurological symptoms.**

critically ill patients. All these things come together and lead to an increased risk of stroke.”

Anticoagulation medications can help reduce that risk, and as WCM clinicians gained experience with COVID patients last spring, they developed a protocol to prevent blood clots. But these medications are not appropriate to give every patient as a matter of course, because they also increase the chance of bleeding. For that reason, anti-stroke interventions must be targeted to those who will most benefit—and that requires clinicians to determine stroke risk as precisely as possible.

Preliminary data, Navi says, suggests that older,

male COVID patients who suffer from cardiovascular comorbidities are most vulnerable—not surprising, as these demographic characteristics have long been connected to stroke risk. But to further refine risk calculations, Navi and his colleagues are using a \$96,000 seed grant from WCM to develop a predictive scoring system that will identify COVID patients who could most benefit from anti-stroke interventions. The project is a partnership with the American Heart Association, and it will use the organization’s nationwide data set of thousands of people who have been hospitalized with COVID.

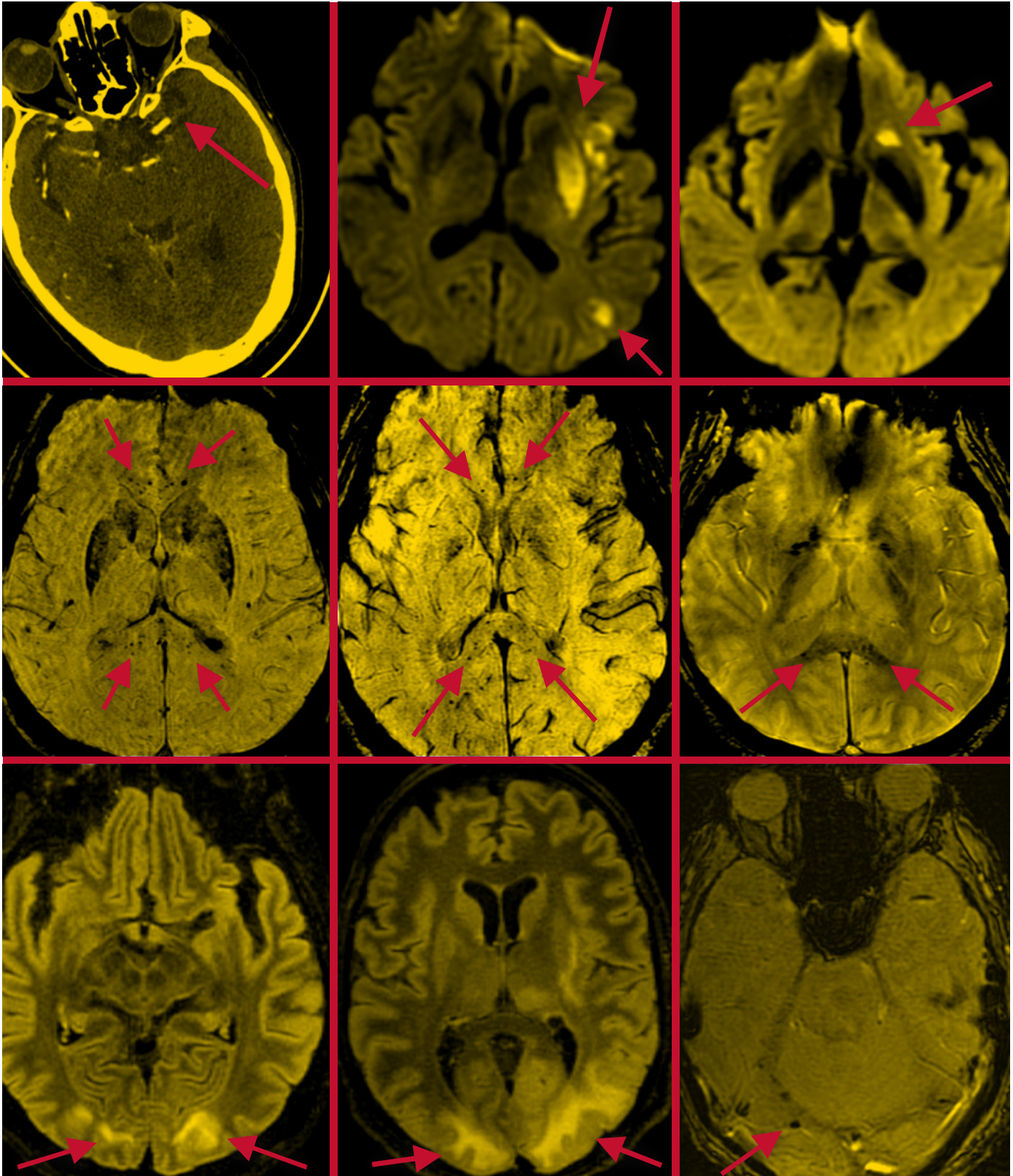
Navi hopes the new tool, along with the findings from other research prompted by the association between COVID and stroke, will have benefits long after the pandemic is over. According to the Centers for Disease Control and Prevention, stroke affects nearly 800,000 Americans a year. It’s the fifth leading cause of death and a major cause of disability. And stroke also continues to affect people who don’t have COVID—which is why Navi takes every opportunity to remind people that fear of the novel coronavirus should not prevent anyone who thinks they may be having a stroke from going to the ED or calling 911. Says Navi: “So many people who would have been eligible for proven acute interventions are now not receiving them because they don’t seek medical attention quickly enough.”

Emergency treatments for stroke are well-established, Navi notes, and long-term risk factors, such as cardiovascular disease, are well known. But what’s missing from our understanding is the short-term risk factors—why someone develops a stroke on a particular day, as opposed to sometime the previous month or the following year. It’s there that knowledge gleaned from the current pandemic could help. “Something has to be that trigger, the thing that puts the patient over the edge,” Navi says. “I think COVID is a trigger in a lot of these patients, and our experience with it is driving home the point that there are things that happen—whether they’re viruses, extremes of stress, pollution in the air, or dehydration—that tip the patient over and lead to the event occurring that day. Perhaps in the future, we can start investigating the utility of preventive strategies in the short-term—for example, starting that patient on aspirin for a week or two—when a short-term risk factor like COVID arises.”

Even patients who don’t experience acute events like stroke sometimes display unusual neurological symptoms. In April, the first wave of patients who had survived serious bouts with COVID began coming off ventilators. Ventilation requires patients to be in a medically induced coma, and in theory >

PHOTO: STUDIO BROOKE; SCANS: PROVIDED





**SEVERE EFFECTS:** Scans that appeared in a paper Navi co-authored in the *American Journal of Neuroradiology* depict the brains of COVID-19 patients suffering from stroke (top row); microhemorrhages in the corpus callosum region (middle row); and posterior reversible encephalopathy syndrome (bottom row), which is characterized by such symptoms as headaches, seizures, and altered mental status. Arrows in each scan indicate areas of concern.



Matthew Fink, MD

they should regain consciousness shortly after anesthesia is stopped—but between a quarter and a third of the COVID patients did not wake up within twenty-four hours. “We were getting three, four, five, sometimes more, consult requests about this every day,” says Nicholas Schiff, MD ’92, the Jerold B. Katz Professor of Neurology and Neuroscience in the Feil Family Brain and Mind Research Institute (BMRI) at WCM, who served as an attending neurologist at NewYork-Presbyterian/Weill Cornell during the height of the pandemic’s first wave. Coincidentally, Schiff had recently co-authored a paper in *Annals of Neurology* about a handful of patients who had been sedated and ventilated as they recovered from cardiac arrest—and who, like these COVID patients, had unexpectedly taken weeks to wake up. “They all made good recoveries, and that was a big surprise,” Schiff says. “One person was still in a coma six weeks later, and the chances of them having a reasonably bright outlook were zero in our minds. We just didn’t know it was possible.”

With the cardiac arrest patients’ experience in mind, Schiff approached the COVID cases with more optimism. MRI scans showed that they did not have brain damage, and over time they started to regain consciousness without any medical interventions—and, despite concerns about long-term effects, they showed slow and continued recovery of consciousness. Schiff and his colleagues believe it’s important to understand what happened, why some patients might be more at risk, and how waking might be facilitated. “If doctors are not expecting this, it can affect their thinking about whether a patient is going to recover,” he says. “Doctors need to make sure that they don’t decide that the fact that a patient is not regaining consciousness right away means they should be treated with less aggressiveness. If there’s no evidence of an injury to the brain, then we just don’t know yet.”

Schiff and colleagues at WCM, in collaboration with Columbia University Irving Medical Center and Massachusetts General Hospital, have received a grant from the James S. McDonnell Foundation to research the phenomenon. They do not attribute the extended waking time to the virus itself, he points out; rather, the many patients ventilated during the COVID pandemic have made common what might once have been rare, offering the team hundreds of patient records to pore over. “We’re doing a deep dive across the three medical centers, looking at all the factors,” Schiff says, noting that these include patient age, comorbidities, and courses of treatment. “As we build a better understanding of what we think is happening here, it will direct our efforts in finding ways to accelerate the recovery process.”

Of course, recovery from severe COVID does not end once a patient is discharged from the ICU, and it can take a while for patients’ brains and minds to heal. Abhishek Jaywant, PhD, an assistant professor of neuropsychology at WCM and a neuropsychologist at NewYork-Presbyterian/Weill Cornell, served as the attending psychologist on WCM’s COVID recovery units, where his role was to assess patients’ cognition and mood, as well as to help them navigate the complex emotions of recovering from a serious illness. “There was a lot of anxiety and loneliness, from the isolation,” he recalls. “But there was also a lot of resilience, people talking about having a second chance at life and really motivated to work hard at rehab so they could go home.”

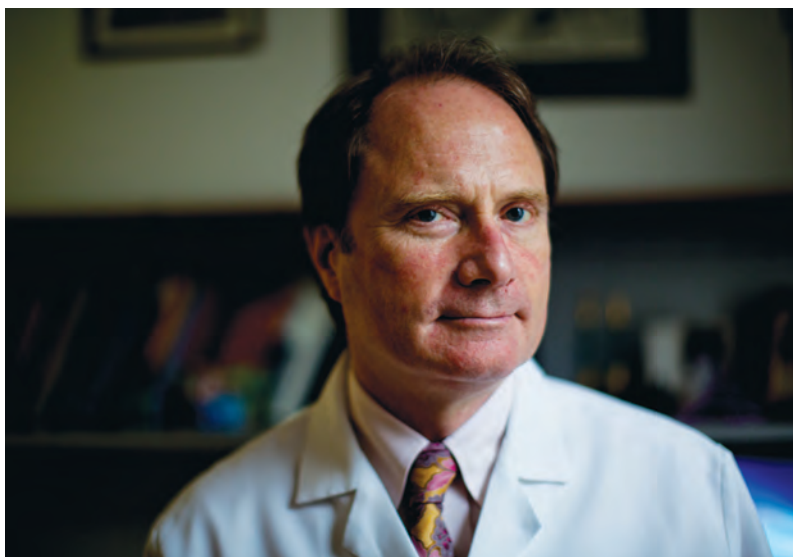
In addition to physical rehabilitation, the patients were also working to overcome cognitive deficits including difficulty concentrating and issues with executive function and memory. As with other



long-term impacts, it remains unclear to what extent the patients' cognition was affected by prolonged periods of intubation and sedation, as opposed to the virus itself. Fink, who has seen an increase in patients complaining of "brain fog," also believes the stress of isolation is a factor. Costantino Iadecola, MD, director of the Feil Family BMRI and the Anne Parrish Titzell Professor of Neurology, agrees with the need to carefully monitor COVID patients for cognitive symptoms that persist for weeks or months. Based on his knowledge of the effect of immunity on cognition, he and his coauthors suggested in a paper published in *Cell* in August that the profound disruption in the immune system associated with COVID may produce lingering, low-grade brain inflammation that could cause anxiety, depression, and cognitive dysfunction.

Regardless of the underlying causes, WCM psychiatrists and psychologists are committed to helping patients regain as much cognitive function as possible. Faith Gunning, PhD, associate professor of psychology in psychiatry, is conducting ongoing research into the effectiveness of an iPad game developed as an intervention for older adults experiencing cognitive weakness—especially in executive function, a set of processes that include attention, working memory, and multi-tasking. Gunning's previous research indicated that the technology can help older adults whose cognitive decline is associated with depression. Now, she and her colleagues are hoping to study the technology among patients recovering from COVID. "Given the demographics of our COVID patients, who are often low-income and older, they need to have something they can do at home, so they don't have the added burden of having to come into the hospital," she says. "But it's also not just older patients—many are younger and no doubt would like to be able to return to the workforce."

As COVID survivors from the first few months of the pandemic returned home and worked to restart their lives, New York, along with the rest of the world, was nervously anticipating further surges of the disease. But in the face of subsequent waves of infections, WCM clinicians and researchers will come to the fight knowing much more about the virus, and about how to mitigate and treat its neurological and psychiatric impacts. "Physicians and scientists around the world are working together, collaborating to try to beat this thing," says Fink. "Here at Weill Cornell we took care of a huge number of patients—thousands of them. We developed a vast experience, and we're confident that outcomes and recoveries are going to continue to improve." ■



Daniel MacGowan, MD

**Recovery from severe COVID does not end once a patient is discharged from the ICU, and it can take a while for patients' brains and minds to heal.**



Faith Gunning, PhD

## NEWS OF MEDICAL COLLEGE AND GRADUATE SCHOOL ALUMNI



Dear Alumni,

Although you are reading this in March, I write now to reflect on my meaningful time as Weill Cornell Medical College Alumni Association president. Joseph Habboushe, MD '07, has taken the helm, and I join all of you with great excitement and anticipation about what comes next for our entire alumni community under his leadership.

During these past two years, Weill Cornell Medicine has accomplished so many great feats for our students—most notably, the creation of our historic debt-free program, announced in September 2019, which allows medical students to have the financial freedom to start careers in medicine without the heavy weight of debt on their shoulders. Our alumni played a pivotal role in establishing and strengthening this transformative program. And thanks to the ongoing generosity of our alumni community, we are moving ever closer to raising the necessary funds to fully fund our scholarship endowment and sustain this program in perpetuity.

There are so many other accomplishments that stand out to me during this time. We have visited alumni at regional events in ten states across the country; heard from astronaut Mae Jemison, MD '81, at Reunion 2018; raised more than \$56,000 to purchase stethoscopes for first-year students in the classes of 2023 and 2024; and funded innovative programs such as a student-run clinic that offers free mental health care for uninsured LGBTQ+ people in New York City. Each of these Alumni Association initiatives—and there are many more—illustrate the kind of inspired commitment that Weill Cornell Medicine alumni have to our students and our community.

Our recent COVID-19 Alumni-to-Student Knowledge (ASK) sessions are a particularly moving example of this dedication. When the pandemic began last March, the board immediately started a discussion with faculty and student leaders about how alumni could help our students during that difficult time. Working together, we quickly developed three virtual ASK sessions that addressed students' anxieties, answered their questions, and gave them a glimpse of what being a doctor during a pandemic was like. This kind of devotion to our students—even in the midst of a global crisis—is exactly what I have come to cherish so much about being part of this alumni community. I have felt so grateful and humbled to be leading this charge, and look forward to continuing this work as a senior adviser in the future.

I want to take a moment to thank Dean Choi, the Board of Overseers, the Alumni Association Board of Directors, and all of the staff, faculty, and students who inspired and supported me during my term as president—especially during the last year, when we all faced unprecedented challenges. I also salute all of our alumni who are serving on the front lines of the COVID-19 pandemic, especially Anthony Fauci, MD '66, President Biden's chief medical adviser and director of the National Institute of Allergy and Infectious Diseases. I have learned—and will continue to learn—so much from this experience. As I pass the baton to Dr. Habboushe, I wish him the best in his tenure. Everyone who serves as president brings something unique to the role, and I look forward to seeing what the future holds for our students and alumni.

*Natasha Leibel, MD '98  
Past president, Weill Cornell Medical College Alumni Association  
NL121@columbia.edu*



## Medical College

### 1950s

**Richard Silver '50, MD '53**, reports that as of July 2019, after approximately 60 years, he formally stopped seeing patients, although he has continued to consult informally on myeloproliferative neoplasm cases. He became an emeritus professor of medicine at Weill Cornell Medicine in November 2019. He continues active research, writing, and teaching. He was pleased to see “double red” classmates **Jack Richard '50, MD '53**, and **Ames Filippone '50, MD '53**, at the virtual 70th Reunion of Cornell's Class of 1950.

**Bernie Siegel, MD '57**: “I have two more published books out. *When You Realize How Perfect Life Is*, co-authored with grandson Charlie, contains our poetry and his nature photos about life from all our perspectives. *No Endings, Only Beginnings* is my perspective on life and my experiences. Someday let's hope med school really gives us an education about people and life.”

**Harry G. Preuss, MD '59**: “I am giving Zoom lectures from home to Georgetown students and itching to get back on campus. My latest book, *Dietary Sugar, Salt, and Fats in Health*, has finally been published; I wrote six chapters and the preface. Along with my co-authors on a paper entitled ‘A comparative pharmacokinetic assessment of a novel highly bioavailable curcumin formulation with 955 curcumin: a randomized double-blind crossover study,’ I won the 2018 Ragus Award for the best research paper in the *Journal of the American College of Nutrition*. I previously won the same award in 2006 and 2016. Currently I have three papers in press—one an editorial on my thoughts concerning COVID-19 and the other two dealing with natural means to mitigate its effects. Interestingly, the use of natural supplements to improve overall health, especially now with COVID-19 everywhere, is finally being recognized.”

**James E. Shepard, MD '59**, reports that he closed down his expert witness practice in December. He is founding director of the Marin County acute and chronic dialysis units and former president of the Marin Heart Association.



**PIONEERING PHYSICIANS:** Roscoe Giles, MD 1915 (left), was WCM's first Black graduate. A 1911 undergraduate alumnus of the Ithaca campus, he was a prominent surgeon whose many honors included attaining the rank of Lieutenant Colonel during World War II and serving as president of the National Medical Association. As one of the few women and the few Black students enrolled at WCM in the late 1940s, Marie Metoyer, MD '51 (right), broke barriers on two fronts. She went on to a long and distinguished psychiatry career in Vermont and New Hampshire.

### 1960s

**Clay Alexander, MD '61**: “Our class is most fortunate to have, under the leadership of **Jack Hughes, MD '61**, a group of several dozen classmates converging online to discuss anything of interest: the pandemic, cutting-edge therapy for other illnesses, art and the work of Class of '61 artists, humor, and even interacting with a physician in South America. We honor classmates we've lost and have come together in the same manner we did during our medical school years. It was never a competition as we were each seeking our own future. Each of us, at one time or another, helped our mates along the way, as well as received help from others. I am lucky to be part of this outstanding group. It expands my life and sustains my ability to learn and laugh.”

**Gus Kappler '61, MD '65**: “The bad news is that I was stranded in my Manhattan apartment for three months before returning home to Amsterdam, NY. The good news is that I had lots of time to complete *One Degree: An Historical Medical Mystery*. I'm excited. It is available as an e-book and paperback from the publisher, BookBaby.com, and on Amazon.”

### 1970s

**John Kirk, MD '70**: “I'm blessed to still be healthy, except for a few orthopedic issues. No longer doing White Mountain hikes, but walks in the woods, snowshoe trips, and kayaking on our many lakes provide a lot of quiet, thoughtful experiences. I left my 45 years of office general internal medicine/geriatrics practice here in New London, NH, two and a half years ago but continue to enjoy half-time practice as a part of our team caring for a nearby nursing home, and additional time as part of our community VNA hospice team caring for end-of-life folks at home. I'm a lot slower than in the past but have sufficient time now to feel satisfied (professionally and personally) with my work. I'm still involved, with nearby Dartmouth Medical School, with our community-based primary care research network (the Dartmouth CO-OP Project), of which I was a founding member and board chair over many years. I still get to interact with medical students, which has been such a source of satisfaction over the years. To be able to be in the setting of a small community hospital/practice, with such intimate contact with and knowledge of our patients, while



**EXPANDING OPPORTUNITIES:** In 1969, James Curtis, MD (pictured here being sworn in to the New York City Board of Health), joined WCM as a member of the psychiatry faculty and an assistant dean for minority affairs. That same year, the initiative that's now known as the Travelers Summer Research Fellowship Program was established, with the aim of encouraging more students from underrepresented groups to consider careers in medicine by bringing them to campus for an up-close look at laboratory or clinical research.

being deeply involved with teaching and research as part of our nearby medical school—for me it has been a perfect setting. In fact, it was our internal medicine/public health professor, Ken Johnson, who left Cornell in 1970 to come up to Dartmouth (along with Tom Almy and Richard Carl) to start the Department of Community and Family Medicine here, the goal of which was to train young clinicians interested in primary care for rural settings, while also preparing our surrounding rural communities for eager new clinicians who would care about academic pursuits while practicing there. It was a prescription for huge success. It was a phone call from him to me during my internship in Chicago that brought me to Dartmouth to finish my training and prepare me for a life in such a rural practice. On the personal front, my beloved wife, Jane, and I remarried this Easter after 12 years apart. The ceremony took place at an old friend's house high on the side of Mount Kearsarge, which had been a central part of our and our three children's lives for many years. The children, one grandchild, and Jane's sister were in attendance (limited by COVID-19). Curious, this thing called life.

No doubt that my immersion in professional life was responsible for our coming apart, but happy to feel whole again, and our three children (and four grandchildren) are all close enough here in northern New England to be able to enjoy the time left together. I've had a lot of publications over the years in various affiliations with Dartmouth and the CO-OP Project, but perhaps the best ever came about this spring with an article in collaboration with a wise cardiologist at Dartmouth on the use of a telehealth connection between primary care clinicians and interventional cardiologists, along with patients, to discuss difficult decisions such as complicated valve replacement in frail elders—the combination of the specialist's technical knowledge and the primary care clinician's knowledge of each patient helping to bring about decisions with which patients were more comfortable. I miss seeing all my old classmates; perhaps we will get to see each other again at our 50th Reunion, if it happens. But there's so much to be thankful for. Gotta go water my pumpkin plants."

**Kenneth Kurtz, MD '70:** "In lockdown in northern Nevada. My wife and I are at home in Reno. We took a recent field trip—to pull dandelions in the front yard. And we plan our first trip south to Puerto BackYarda, to turn on the sprinkler system. I took out one of Patricia's saucepans and stuck it in the lawn. I'm trying to grow our own pot."

**Patricia A. Dubose, MD '72:** "I'm keeping up with medical literature, finishing EHR charting, and keeping up with my two daughters' families. Alison is a pediatrician; her husband is a pediatric ED doctor who heads the sedation service at Connecticut Children's Medical Center. They have children ages 13, 10, and 6. Lauren is an MBA with a healthcare concentration, works for Aetna in Hartford, and has a 2- and a 4-year-old with her entrepreneur husband. I practiced in Atlanta after my ID fellowship and moved to Connecticut several years ago to be close to their families. I love going to kids' basketball, soccer, volleyball, and chorus. We went on a family ski trip to Vermont and also traveled to Sun Valley with Lauren's family. I remember the class spirit, camaraderie, and Christmas shows from medical school. I'd love to hear from classmates. Cheers to **Tony Fauci, MD '66**, once again a smart and honest voice

PHOTOS: THIS PAGE, ALLEN GREEN/VISUAL DEPARTURES, LTD.; OPPOSITE PAGE, ED LETTAU



in the middle of the political crossfire on coronavirus.”

**Paul F. Miskovitz, MD '75**, continues to practice consultative gastroenterology, gastrointestinal endoscopy, hepatology, and gastrointestinal parasitology as a clinical professor of medicine at Weill Cornell Medicine and an attending physician at NewYork-Presbyterian. Work on the Department of Medicine Quality Assurance Committee, Continuing Medical Education Committee, Institutional Review Board, and Committee of Review (academic appointments) keeps his free time occupied. As a member of the Alumni Association board, he continues to moderate the very popular evening Alumni-to-Student Knowledge (ASK) sessions, where students submit a requested topic or field of medicine and alumni are invited to participate in an interactive round-table session with them. In a span of two weeks, three such sessions were held (virtually) on the coronavirus pandemic. He and his wife, Leslie, enjoy travel, dining out (pre-COVID-19), and hearing from classmates.

**Steven Koenig, MD '77**: “This has been an unusually busy spring. I have retired from my ophthalmology practice at the Medical College of Wisconsin after 37 years and look forward to working in the vineyard, tending my bees, and raising heirloom apples. We celebrated the virtual graduation of my daughter, **Lisa Koenig, MD '20**, from WCM. She will begin an ophthalmology residency at Weill Cornell after a transitional internship at Memorial Sloan Kettering this year.”

## 1980s

**Bob Hajosy, MD '82**: “**Robert Felder, MD '82, Gerry Bustillo, MD '82**, and myself were med school roommates in Lasdon House, Apt. 12E. Turns out we all independently and coincidentally transplanted to beautiful Southern California after residency training. I'm happy to say that we still get together a couple of times a year to reminisce and share news of our careers and families. We also toast our deceased friend and classmate, **Lori Altshuler '78, MD '82**, who was instrumental in bringing us together as apartment-mates during our second year at WCM. She was a good friend who obviously had good people instincts. I also stay in touch with **Tony Demond, MD '82**, who travels



**FACULTY LEGEND**: Carol Storey-Johnson, MD '77 (seen here with a patient in 1981), devoted her entire career to Weill Cornell Medicine—from medical school onward. The beloved clinician, educator, and administrator retired in 2019; she's now a professor emerita of medicine and a member of the Alumni Association Board of Directors.

a lot and still works ER shifts in various locations here in the West including on Native American reservations. I am also still in touch with Dr. George Gray (retired faculty), who was my adviser, friend, and mentor at WCM. While my medical school years were not the happiest of my life (I'm glad medical schools are now paying more attention to student morale), I am very thankful for the teaching and experiences afforded me during my years at WCM, like summer internships and the Cambodian relief work with the IRC in Thailand. I'm also grateful that, thanks to my parents and some significant financial aid, I was not excessively burdened by debt upon graduation. I am rapidly approaching mandatory retirement from the Southern California Permanente Medical Group as an ob/gyn generalist. Kaiser-Permanente pioneered pre-paid health and preventive care in the West, and was an excellent career choice for me. I now envision looking for volunteer opportunities in education and global population

**'Robert Felder, MD '82, Gerry Bustillo, MD '82, and myself were med school roommates in Lasdon House, Apt. 12E. Turns out we all independently and coincidentally transplanted to beautiful Southern California after residency training.'**

— Bob Hajosy, MD '82



**STUDENT SUPPORT:** Established in 1983, the Committee on Behalf of Minority Students raised funds to support financial aid programs for medical students from underrepresented groups, with the aim of overcoming the monetary barriers preventing many aspiring physicians from pursuing their dreams. Its activities also included events and luncheons, such as this one from 1985.

**'I'm in my second year as a pediatrician for the Seminole Tribe of Florida, after working at a variety of community health centers, and remain active in working toward a better world.'**

— Joni Albrecht, MD '85

control, believing that a sustainable world will require a sustainable (i.e., limited) population growth rate. Interestingly, I came to this conclusion after raising four children to adulthood. Live and learn. Hello to all my old friends at WCM, many of whom are also nearing retirement. Hopefully we'll soon have more time to keep in touch."

**Maureen Tierney, MD '83:** "I have just completed seven years as medical director for healthcare-associated infections/antimicrobial resistance for the Nebraska DHHS. I spent the last four months focused on Nebraska's public health response to COVID-19, which has been intense—but I am very sure not nearly so in comparison to what my classmates who stayed in New York endured. In July, I will become chair of clinical research and assistant dean for public health at Creighton University School of Medicine. I still can't believe this New York City gal is in Nebraska, but our sons have become true Cornhuskers and are very happy here, and so, therefore, are we."

**David A. Haughton, MD '84:** "It will be some time (18 months?) before a 'new normal' is reached and everyone has either been exposed to COVID-19 or has received an effective vaccine. For now, the border is

closed, Washington State remains locked down (but about to slowly loosen restrictions), and we are home in British Columbia safe and self-isolated. We read of serious suffering among so many people who work so hard for so little and with such a tenuous safety net, if any. We recognize the profound dedication shown by so many healthcare and essential workers who are overwhelmed and feel vulnerable. Lyne and I have focused on remaining generous, calm, patient, and connected to our family, friends, neighbors, and fellow humans—while remaining two meters distant and frantically scrubbing our hands. Please take care and be safe, my friends."

**Joni Albrecht, MD '85:** "I'm in my second year as a pediatrician for the Seminole Tribe of Florida, after working at a variety of community health centers, and remain active in working toward a better world. My husband, Julio, teaches ESOL (English to Speakers of Other Languages) in a local elementary school, and son Malik became a public defender after graduating from the University of Miami on a full-tuition scholarship. Home remains Delray Beach, FL, but my work is remote during the week. I still believe that healthcare is a human right."

**David M. Brams, MD '87:** "I have been at Lahey Hospital and Medical Center since 1996. I was recently named the chairman of general surgery."

**Walter Klein, MD '87,** was a guest speaker at WCM's Alumni-to-Student Knowledge (ASK) event in May. In the first of three sessions examining the COVID-19 pandemic, Dr. Klein spoke to medical and graduate students about past health crises at the Medical Center and beyond, as well as their impact on the healthcare system.

**Theresa Rohr-Kirchgraber, MD '88,** has been awarded an Indiana University School of Medicine IU Trustee Teaching Award in recognition of her outstanding teaching and leadership. Her blog post "Front Line Guilt," written with other female physicians and scientists, discussed the feelings of doctors and researchers not working on COVID-19; it was covered by Side Effects Public Media and other outlets. Theresa and her husband, **Paul Kirchgraber, MD '88,** are splitting their time between North Carolina and Indiana and plan to welcome their second granddaughter in the fall.

PHOTOS: THIS PAGE, MEDICAL CENTER ARCHIVES OF NEW YORK-PRESBYTERIAN/WEILL CORNELL MEDICINE; OPPOSITE PAGE, SHWETA BANSIL, MD



**Scott Rodeo, MD '89**, head team physician for the NFL's New York Giants, received the Athletic Trainers Society of New Jersey's 2020 Dr. Timothy Hosea Team Physician Award. The award is given annually for excellence in care, research, volunteer and charitable efforts, and dedication to the athletic training profession. Dr. Rodeo has been the head team physician for the Giants since 2015, after being associate team physician from 2000–15. He has also served as team physician for USA Swimming in the 2004, 2008, and 2012 Olympics.

## 1990s

**Ron Cowan, MD '94**: "I accepted a new position as Harrison Distinguished Professor and chair of the Department of Psychiatry and professor in the Department of Anatomy and Neurobiology at the University of Tennessee Health Science Center in Memphis, TN, as of July 1."

**Jeffrey Yao, MD '99**: "I was promoted to the rank of professor of orthopedic surgery

at Stanford University Medical Center in Palo Alto, CA, effective May 1."

## 2010s

**Daniel Agarwal, MD '13**: "I completed my fellowship in vitreoretinal surgery at Yale in June and moved back home to Southern California. I'll be starting work in August as a retina specialist at the Miramar Eye Specialists Medical Group, based in Ventura, CA."

**Hanano Watanabe, MD '13**: "I finally finished my pediatric cardiology fellowship at Columbia/Cornell and I will be an attending physician in the Division of Pediatric Cardiology at Maimonides Medical Center in Brooklyn. Many members of the Class of 2013 remain in Yorkville and at Weill Cornell. Some of my friends, such as **Juveria Abdullah, MD '13**, came from UCLA to help with COVID-19. **Angela Arbach, MD '14**, who started with us as Class of 2013, came from Cayuga Medical Center to help with COVID-19. So proud of our class."



**STRONGER TOGETHER:** As the racial justice movement took shape across the nation and the world last spring, members of the WCM community gathered to express their support for combatting structural racism in medicine and beyond.



## Graduate School of Medical Sciences

**'I married in 2003 to an artist and between the two of us we make up a whole brain: I am the left side and he is the right side.'**

— Carol A. Mirenda, MS '85

**Miryam Z. Wahrman, PhD '81**, professor of biology at William Paterson University, has been interviewed for her expert advice on reducing the risk of infection. Her book, *The Hand Book: Surviving in a Germ-Filled World*, provides empowering information and tips on how to lower the risk of infectious disease. Since the coronavirus pandemic began, she has appeared on and been quoted by BBC TV, Fox News, NPR, *Business Insider*, Parents.com, Yahoo Lifestyle, the *Guardian*, Bottom Line Health, and other publications and websites.

**Carol A. Mirenda, MS '85**: "I retired from Bayer Pharmaceuticals in October 2017 after 17 years of working in the cell line development lab. My group made tens of thousands of clonal cell lines for a variety of biopharmaceutical therapies. Two even made it to market: Kovaltry and Jivi, both factor VIII replacement therapies for hemophilia A. Prior to my stint at Bayer, I was at UCSF for 14 years in the lab of Stanley Prusiner. My work contributed to the Nobel Prize he won in 1997 for physiology and medicine. I've enjoyed being in the San Francisco Bay Area. I found an ice skating club and have been ice dancing since 1991. I married in 2003 to an artist and

between the two of us we make up a whole brain: I am the left side and he is the right side. Stay safe, everyone."

**Michael Sanders, PA '94**: "I work in orthopedic surgery at the Lebanon V.A. Medical Center. I ride my bicycle ten miles every day and spend time with family and friends. For two and a half years I've been battling metastatic prostate cancer. In 2017, I had a robotic radical prostatectomy. Three months later it metastasized to the upper pelvic lymph nodes, then I had 40 treatments of pelvic radiation. I've been doing Lupron injections for two years. I've recently stopped the injections and now everything is OK. My Gleason score was 9 and I had no symptoms. I'd like to hear from Weill Cornell friends."

**Naira Rezende Simmons, PhD '12**: "I am an intellectual property attorney and I have recently joined the law firm FisherBroyles as a partner."

**Lorrie Clement, PA '16**: "I married Ryan Davis, who is from Kansas City. We met in Sheridan, WY, where he is the women's basketball coach at Sheridan College. I worked mainly in the orthopedic setting but am now running an urgent care clinic with a doctor who is the owner."

### We want to hear from you!

#### Share your news with your classmates

Email Chris Furst: [cf33@cornell.edu](mailto:cf33@cornell.edu)

Send by mail to: Weill Cornell Medicine  
401 East State Street, Suite 301  
Ithaca, NY 14850

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**'46 MD—Arthur B. DuBois** of New Haven, CT, December 24, 2019; research scientist; clinician; professor of physiology and medicine, University of Pennsylvania; director, John B. Pierce Foundation; worked with committees selecting scientist-astronauts and researching submarine escape; veteran; co-author of *The Lung*; active in professional affairs.

**'49 MD—James A. Lundquist** of Cornwall, PA, formerly of Fairbanks, AK, January 27, 2020; physician; practiced at the Tanana Valley Medical Clinic; veteran; enjoyed reading, book collecting, and storytelling.

**'50 MD—Robert C. Hafford** of Bay City, MI, and Naples, FL, January 15, 2018; internist; veteran; enjoyed boating, birding, and travel; conducted conservancy tours in Florida; active in community and professional affairs.

**'49 BA, '52 MD—Irving M. Blatt** of Schriever, LA, May 25, 2019; ear, nose, and throat surgeon; professor and chair of otolaryngology, LSU; director, Julius Lempert Memorial Otology Clinic; established the Kresge Hearing Research Laboratory; researched Bell's palsy; taught Bible study; active in community, professional, and religious affairs.

**'50 BA, '54 MD—Harry W. Daniell** of Redding, CA, March 26, 2020; physician; founding faculty member and clinical instructor, Mercy Redding Family Practice Residency Program with UC Davis Medical School; researched the connection between cigarette smoking and premature aging; veteran; author; enjoyed running, camping, fly-fishing, and hiking; active in community, professional, religious, and alumni affairs. Lambda Chi Alpha.

**'50 BA, '54 MD—Ralph C. Williams Jr.** of Santa Fe, NM, February 2, 2020; rheumatologist; chief of the rheumatology division, University of Florida; professor and chair of internal medicine, University of New Mexico; professor of internal medicine and rheumatology, University of Minnesota; conducted research at The Rockefeller University; chief resident in internal medicine at Massachusetts General Hospital; veteran; author; painter; member of the New Mexico Watercolor

Society; active in community, professional, and alumni affairs. Sigma Phi.

**'55 MD—John V. Abbott Jr.** of Fort Lauderdale, FL, January 23, 2020; psychiatrist; medical director, Brooklyn Center for Psychotherapy; founder, Valley Behavioral Medicine Clinic; veteran; Hanoverian horse breeder; enjoyed travel, skiing, swimming, tennis, dressage, and collecting Renaissance and Baroque clocks and bronzes; active in civic, community, and professional affairs.

**'57 MD—Costas T. Lambrew** of Scarborough, ME, December 12, 2019; chief of cardiology and director, division of cardiology and cardiac intensive care unit, Maine Medical Center; professor of medicine at Weill Cornell Medicine, SUNY Stony Brook, and the University of Vermont; also worked at the National Institutes of Health, New York Hospital, Nassau County Medical Center, and Unum; author; enjoyed reading, singing, sailing, and travel; active in professional affairs.

**'52 BA, '58 MD—Robert E. Zickel** of Dover Plains, NY, June 9, 2020; attending surgeon and director of orthopedics at St. Luke's Hospital; designed and patented the Zickel Supracondylar Femoral Nail to treat fractures of the femur; professor and chair, Department of Orthopedic Surgery, New York Medical College; volunteer, Columbia University Health Service; football team doctor, Columbia Lions; consultant, Riverfront Medical Center; veteran; wrote and performed original musicals; avid golfer.

**'59 MD—Richard C. Conroy** of Palm Beach, FL, formerly of Waccabuc, NY, June 4, 2020; psychiatrist; director of psychiatry, Northern Westchester Medical Center; veteran; active in community and professional affairs.

**'56 BA, MD '60—Frederick S. Erdman Jr.** of Estero, FL, formerly of Canandaigua, NY, January 11, 2020; radiologist; partner, IDE Radiology; veteran; enjoyed sailing, skiing, golf, tennis, and travel; active in community, religious, and alumni affairs. Phi Sigma Kappa.

**'62 MD—Thomas H. Snider** of San Antonio, TX, December 28, 2019; pathologist; chief of staff, Metropolitan Hospital; veteran; enjoyed skiing, tennis, weightlifting, biking,

running, and reading; active in community, professional, and religious affairs.

**'63 MD—Alfred F. Parisi** of Osterville, MA, April 15, 2020; professor of medicine, Brown University School of Medicine, and chief of cardiology, Brown University Hospitals; chief of cardiology, West Roxbury V.A. Medical Center; associate professor of medicine, Harvard Medical School; senior associate in medicine, Peter Brent Brigham Hospital (now Brigham and Women's Hospital); associate professor of medicine, University of Maryland School of Medicine; chief of cardiology, V.A. Hospital Baltimore; veteran; author; president, American Society of Echocardiography; enjoyed baseball, good food, and conversation; active in professional affairs.

**'63 MD—Benjamin B. Storey** of Lexington, KY, January 18, 2020; psychiatrist; veteran.

**'64 MD—Robert M. Schmidt** of Milwaukee, WI, April 10, 2020; physician, Milwaukee Medical Clinic; also practiced at Columbia, St. Michael's, and St. Mary's Ozaukee hospitals; assistant clinical professor in surgery, Medical College of Wisconsin; researcher; author; youth hockey coach; Rotarian; enjoyed skiing, camping, and cabinet making; active in community and professional affairs.

**'66 MD—Richard U. Levine** of New York City, April 21, 2020; professor of obstetrics and gynecology at Vagelos College of Physicians and Surgeons; ob/gyn at NewYork-Presbyterian Hospital; pioneer in minimally invasive gynecological surgery; vice chair for development; active in professional affairs.

**'64 BA, '68 MD—Paul E. Reading Jr.** of Poway, CA, January 31, 2020; ob/gyn; founding member, Pomerado Hospital; enjoyed golf and San Diego sports teams; sang with the Sherwoods; active in community, professional, and alumni affairs. Chi Psi.

**'75 MD—Alan A. Morgenstein** of Santa Rosa, CA, December 8, 2019; specialist in infectious disease; enjoyed travel.

**'86 BA, '90 MD—Vincent P. Ascrizzi** of Great Falls, VA, May 24, 2020; pediatrician, Reston Town Center Pediatrics; active in alumni affairs. Phi Kappa Psi. Wife, Molly (Moran), BS '89.



## 'He's a Miracle'

An emergency medicine physician recovers after a months-long battle with COVID-19—and longtime colleagues celebrate



**GRATEFUL PATIENT:** Chris Belardi, MD, leaving the hospital amid well wishes

**T**he morning of September 8, Chris Belardi, MD, put on his signature white scrubs, slipped on his white coat, and clipped on his hospital badge, just as he has done so many times in his career as an emergency medicine physician at NewYork-Presbyterian/Weill Cornell Medical Center. But this was no ordinary day for him. Standing in his sun-drenched room on the seventeenth floor, it was his 164th straight day in the hospital and—as a patient who had recovered from COVID-19—he was finally ready to go home.

With his wife, Joyce, and sons, Jess and Christian, by his side, Belardi walked out of his room to the cheers of his colleagues—the same dedicated staff who had been rooting for him since he was admitted March 28 and who supported him as he fought for his life. “We’re really grateful for all the wonderful care,” says Joyce. “It was truly amazing—nonstop, day and night, twenty-four hours. It all worked.”

Belardi, who is also a clinical instructor in emergency medicine at Weill Cornell Medicine, made the day even more memorable when, to the surprise of everyone who waited for him outside NewYork-Presbyterian/Weill Cornell, he walked out of the revolving doors in his scrubs. At the end of the walkway, Rahul Sharma, MD, emergency physician-in-chief at NewYork-Presbyterian/Weill Cornell and chair of emergency medicine at WCM, spoke on behalf of the department, calling Belardi an inspiration and that moment “one of the happiest days in all of our lives.” “We don’t often see patients in his condition get better,” says Bradley Hayward, MD, an attending physician in the Medical Intensive Care Unit (MICU) at NewYork-Presbyterian/Weill Cornell and an assistant professor of clinical medicine at WCM. “He’s a miracle who was helped by a multidisciplinary team that was with him every step of the way.”

Admired for the passion he brings to his work, Belardi is known for having a big smile on his face and showing up to his shift with an armful of homegrown goodies for his colleagues: fresh fruit, eggs, and jars of honey from his farm upstate. “Chris would always bring us his seasonal harvest,” says Sharma. “It was all done out of the goodness of his heart—generosity from a consummate professional.” When Belardi was diagnosed with COVID-19 in March, the hospital came together to provide him the kind of care, commitment, and generosity he always showed others. In April, he was intubated and placed in a coma in the MICU. When he was well enough to emerge from the coma in July,

Hayward summed up the feeling in a single word: “euphoria.”

Belardi continued to surprise and inspire his colleagues. In early August, he was transferred to the rehabilitation floor. When he arrived, he needed two people to help him get out of his

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**When Belardi was well enough to emerge from the coma in July, one of his physicians summed up the feeling in a single word: ‘euphoria.’**

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wheelchair. About two weeks later, he could walk 120 feet. A team of physical therapists, occupational therapists, and speech and language pathologists guided him even further along his road to recovery. “He was always in good spirits,” says Lauren Godas, a registered nurse in the Acute Inpatient Rehabilitation Unit. “He was always motivated to keep moving and to get better.”

It all culminated when dozens of Belardi’s colleagues gave him a happy send-off home after five long months. “His recovery has been remarkable,” says Nasim Chowdhury, MD, an attending physician in the unit and an assistant professor of clinical rehabilitation medicine at WCM. “His resiliency has been inspiring, and it’s been amazing to watch. It takes a village: therapists, nurses, doctors. Chris made great strides.” Says Sharma: “His illness and hospitalization brought our team even closer. This was a true test for our department, and I am proud of the way we came together when one of our own was in crisis. It unified us as a group, and made us better and stronger.” ■

*This story first appeared in NewYork-Presbyterian’s Health Matters.*

PHOTO: PROVIDED

**Richard T. Silver, MD '53**  
**A Legacy Gift**  
**to Support Future**  
**Physicians**

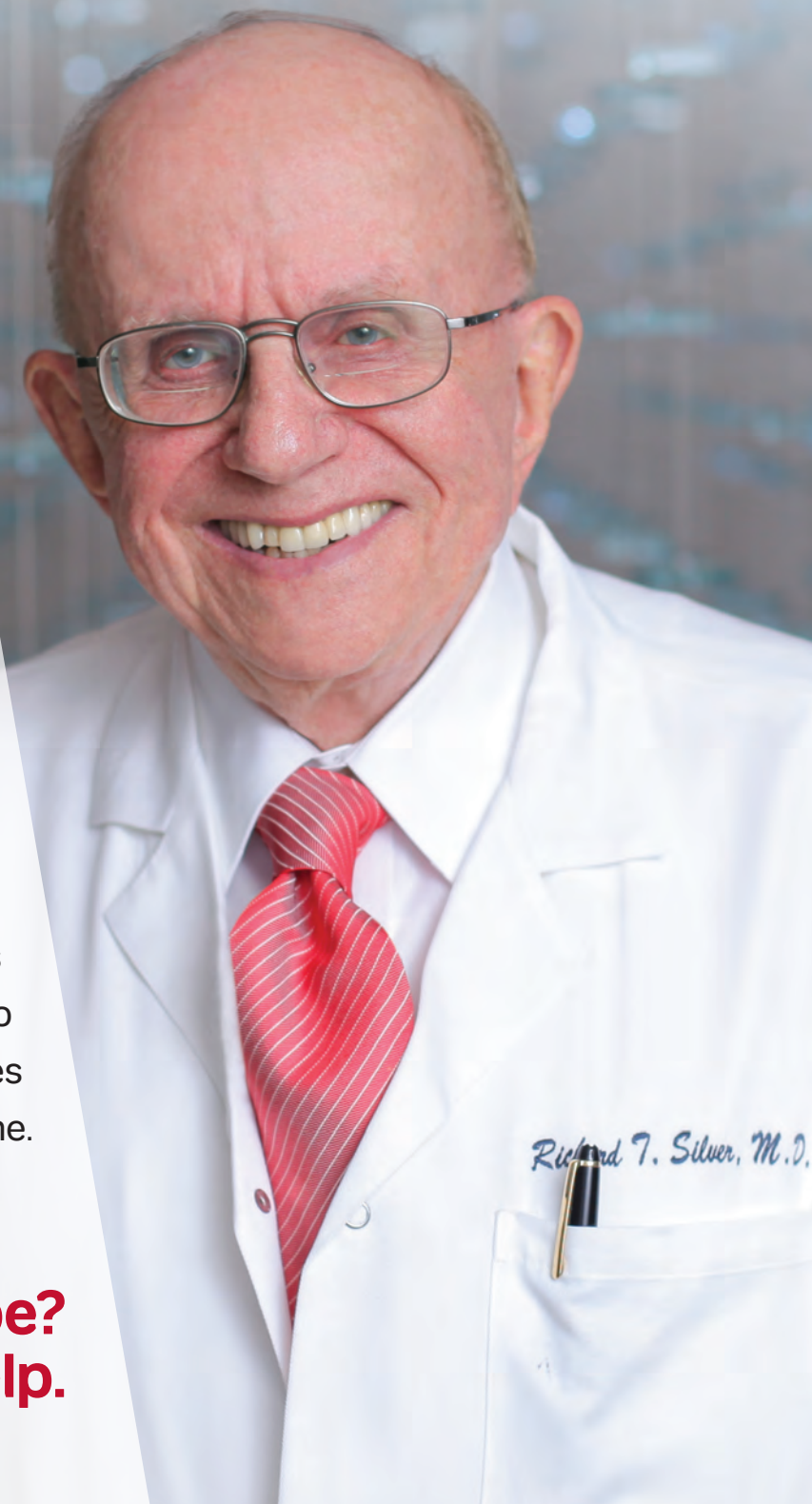
Dr. Richard T. Silver, Professor of Medicine and Emeritus Director of the Richard T. Silver, MD, Myeloproliferative Neoplasms Center, included a bequest in his estate plan that honors the memory of his parents and will endow scholarships for Weill Cornell Medicine students who are pursuing research in basic sciences and clinical medicine.

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