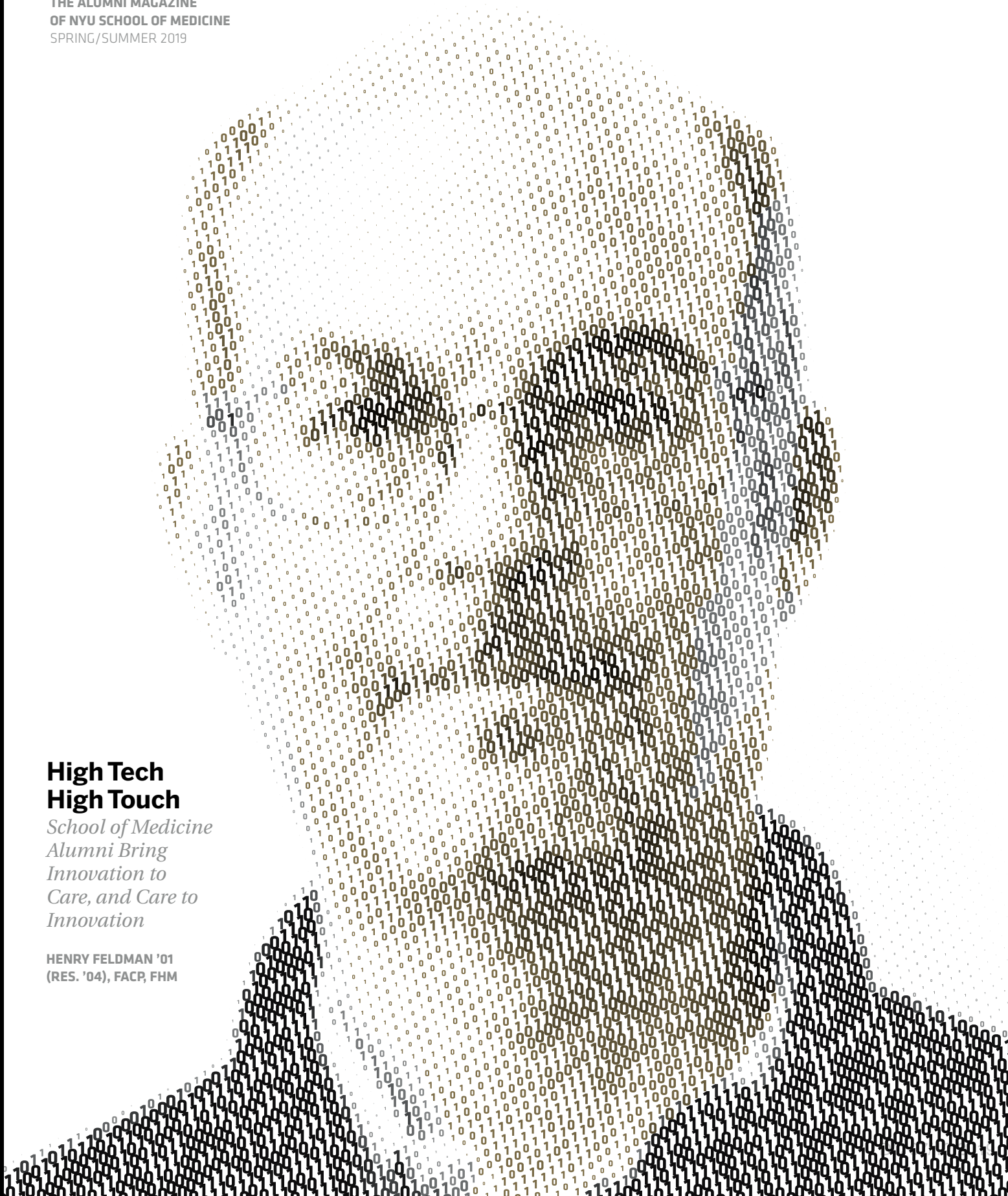
GRAPEVINE

THE ALUMNI MAGAZINE
OF NYU SCHOOL OF MEDICINE
SPRING/SUMMER 2019



High Tech High Touch

School of Medicine Alumni Bring Innovation to Care, and Care to Innovation

HENRY FELDMAN '01
(RES. '04), FACP, FHM

A Historic Medical Breakthrough: **Free Tuition!**

NYU School of Medicine is now offering full-tuition scholarships to all of its current and future students in the MD degree program.

Alumni giving helped us achieve this landmark; now your philanthropy is essential for sustaining our full-tuition scholarship initiative in perpetuity. Help us continue to dramatically reduce medical student debt, so future doctors can pursue their true passions.

For more information, contact Diana Robertson at 212-404-3510 or Diana.Robertson@nyulangone.org

Make an online donation at nyulangone.org/give/scholarships

NYU School of Me i

PHOTO: JULIANA THOMAS

Dreaming Big

Photo: John Carnett

Technology and innovation have long been core priorities of our institution. Early in my tenure, we invested in Epic, our electronic health records platform; this important—and, as it turned out, prescient—decision became the foundation for many innovative approaches to clinical care. In fact, innovation is at the forefront of everything we do.

For example, our newest sites deeply integrate the power of technology in order to transform how we deliver patient care, perform research, and educate our outstanding School of Medicine students. The Helen L. and Martin S. Kimmel Pavilion and Hassenfeld Children's Hospital, among the most digitally sophisticated inpatient facilities in the country, reflect careful consideration of the provider and patient experience. Our MCIT (Medical Center Information Technology) and Real Estate Development and Facilities teams, in collaboration with other NYU Langone Health departments, have seamlessly integrated systems and thoughtfully designed technologies including our cutting-edge ORs and the in-room MyWall screens that connect patients instantly to caregivers, their health information, and the outside world. The Science Building creates a physical and digital environment that is especially suited to conducting research and sharing data with partners around the globe. At the School of Medicine, we have also implemented multiple programs to enhance how we deliver training for students and faculty, and to increase access to quality data.

Now we are in the midst of a full IT integration of NYU Winthrop Hospital, starting with the successful migration of 600 Winthrop ambulatory providers and their offices to Epic. We also added 2 million Winthrop patient records into the system.

These are not just high-priority initiatives for NYU Langone Health. They are also opportunities to reexamine every function we perform. Our job is to imagine and achieve programs, projects, and approaches worthy of such extraordinary tools and facilities. So I'm proud to present stories of some of our alumni who are doing just that: using technology, innovative thinking, and AI as only the starting point for what they hope to accomplish for their patients, for science, and for the betterment of healthcare far beyond the confines of this institution.

Dr. Henry Feldman and Dr. Dara Richardson-Heron are addressing the challenges of AI: Dr. Feldman, at IBM Watson Health, from the digital side—how we as physicians incorporate the vast potential of big data into our work; Dr. Richardson-Heron, at the NIH, from the human side—how we ensure that big data sets reflect full diversity and build trust among the huge numbers of patients who fuel them. Closer to home, Dr. Roberto Flores is changing the face of transplant surgery, using innovations such as high-definition 3D printing to restore and rebuild with precision and life-changing results.

And this is the tip of the iceberg. You, our alumni, bring the culture of the School of Medicine—dream big, create new solutions, collaborate, and build excellence—to your daily work. We look forward to continuing to celebrate your achievements in these pages.

Sincerely,

ROBERT I. GROSSMAN, MD
THE SAUL J. FARBER DEAN AND CEO

"OUR JOB IS TO IMAGINE AND ACHIEVE PROGRAMS, PROJECTS, AND APPROACHES WORTHY OF SUCH EXTRAORDINARY TOOLS AND FACILITIES."

GRAPEVINE

FEATURES

Tech and Change

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Henry Feldman ’01 (Res. ’04), FACP, FHM on the ever-evolving nature of innovation and how doctors can harness AI to enhance their own practices.

In It for All of Us

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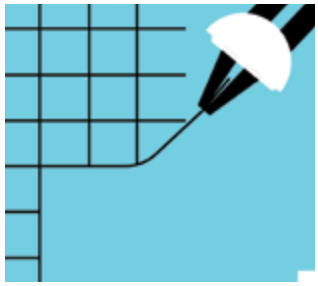
Dara Richardson-Heron ’89 (Res. ’92) is building one of the largest—and most diverse—biomedical data sets in the world.



Fit to Print

26

From breakthroughs in 3D printing to his work on NYU Langone’s historic face transplant, Roberto Flores, MD ’01 (Res. ’04, ’07) is making a lot of news.

NEW(S)

HEARD

THE ALUMNI MAGAZINE OF NYU SCHOOL OF MEDICINE
SPRING/SUMMER 2019

CONTACT INFORMATION
Please contact us at alumnirelations@nyulangone.org or 212-263-5390. You can also write to us or visit our website.

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New York, NY 10016

med.nyu.edu/alumni

It was with no small amount of pride that I read "Full Tuition Scholarship for All" in the Fall 2018 issue of *Grapevine*. As a member of the inaugural class to experience the C21 curriculum, a student during both the launch of the three-year MD program and the post-Sandy relief-and-renovation efforts, I'm no stranger to the adventurous and innovative spirit that permeates NYU School of Medicine—yet even I was awed by the announcement that my medical alma mater would become tuition free.

Many friends and colleagues have attempted to rile me with versions of "Aren't you jealous?" I'd be lying if I didn't admit a shade of envy, but much more prominent is the genuine sense of honor and gratification I feel in seeing NYU lead the charge on a revolution in how America approaches medical education.

Indeed, it has troubled me to note how many more articles have been published critiquing the scholarship than praising it—the most fallacious of which contend that the generosity is misplaced altogether, or should be reserved for those physicians committing themselves to a career in primary care, an underserved community, et cetera. This wrongheaded assault frequently originates from within the physician community, which has felt particularly personal to me as a neurosurgeon and a resident at Mayo Clinic. Medicine already has a recruitment problem—law and business offer shorter and more lucrative indentures, less psychological strain, and greater remunerations in partnership. To further disincentivize bright, talented individuals from specialties such as mine will primarily be a disservice to the patients themselves.


New(s)

ACHIEVEMENTS

Full-Tuition Scholarships for All

"THIS DECISION RECOGNIZES A MORAL IMPERATIVE THAT MUST BE ADDRESSED, AS INSTITUTIONS PLACE AN INCREASING DEBT BURDEN ON YOUNG PEOPLE WHO ASPIRE TO BECOME PHYSICIANS."

I have yet to meet a doctor who is not living a life of service every day, or whose tireless efforts on behalf of their patients should be considered unworthy. This sensibility was forged at NYU, where we saw no difference in the humanity of the patients at Bellevue, Tisch, or the VA—nor in the dignity of the doctors caring for them.

CHRISTOPHER S. GRAFFEO '14
Neurologic Surgery Resident
Mayo Clinic Rochester

*We'd love to hear from you! Please send your letters to the editor to **alumnirelations@nyulangone.org**. We reserve the right to edit for length.*

CORRECTIONS

In "Distant Memories of Medical School" (Fall 2018), we incorrectly stated that Dr. Martin Duke attended medical school from 1951 to 1954. In fact, Dr. Duke started his medical education in 1950.

Also in the fall issue, the caption for our "Look Back" photo identified the doctors seated in the front row out of sequence. The correct order: Gordon Douglas, Sophia Kleehman '24, Gray Twombly, Fritz Beller, Alvin Weseley.

We apologize for these errors.

Registration Is Open for CME Courses at NYU

Illustration: Miguel Montaner

NYU SCHOOL OF MEDICINE provides the highest standard of continuing medical education (CME). Our CME program, which is formally recognized by the Accreditation Council for Continuing Medical Education (ACCME), maintains and furthers the trifold mission of the institution. We offer courses—including live activities and educational materials—in nearly every area, developed and taught by leaders in medicine from NYU Langone Health and around the world. We invite NYU School of Medicine alumni to attend our exceptional CME courses at a 15 percent discount by entering the code NYUSOMALUM at registration.

*Please visit **nyulmc.org/cme** for more information and to see a complete listing of course offerings.*

New(s)

BY THE NUMBERS

Facts + Figures: NYU Long Island School of Medicine

60+
faculty

1st
three-year medical school offering full-tuition scholarships in the nation

24
students entering in 2019

120
planned total enrollment in 2023

Photo: Chris Cooper

NYU Long Island School of Medicine Opens This Summer

With full-tuition scholarships for all students and an innovative three-year program, the new school will train more primary care doctors to help alleviate the nationwide physician shortage.

IN JULY, NYU Long Island School of Medicine will welcome 24 students into an accelerated, three-year MD program exclusively devoted to training primary care physicians, including those interested in internal and community medicine, pediatrics, OB/GYN, and general surgery. Students will receive conditional acceptance to do their residency in one of these programs at the NYU Winthrop Hospital Campus in Mineola through the NRMP (National Resident Matching Program). This innovative approach to a new primary care-focused medical school in Long Island will complement the more specialty-focused NYU School of Medicine in Manhattan.

In February, the Liaison Committee on Medical Education (LCME), the accrediting body for MD programs in the United States and Canada, granted preliminary accreditation to the new medical school, located on the NYU Winthrop Hospital campus. Parts of the medical school building are being renovated to accommodate new classrooms and offices, thanks in part to a $1 million state grant from Governor Andrew M. Cuomo's annual Regional Economic Development Council competition.

"There is a growing trend toward a flexible, accelerated MD curriculum for students who know early on the area of medicine in which they wish to specialize," says Steven Shelov, MD, founding dean of the NYU Long Island School of Medicine. "We've worked closely with the LCME to develop a comprehensive and rigorous program that meets the needs of today's students, and we look forward to collaborating further on the next steps in establishing the new medical school."

The American Association of Medical Colleges estimates that there will be a shortage of up to 43,000 primary care providers by 2030. In New York State, just 30 percent of the 70,000 practicing physicians provide primary care. To help eliminate such dramatic shortages, NYU Long Island School of Medicine will accept approximately 40 students each academic year starting in 2023 (for a total of 120 across all three classes). According to the founders, this new school represents the latest step in NYU's commitment to preparing the next generation of physicians to assume local and national leadership.

THIS INNOVATIVE APPROACH TO A NEW PRIMARY CARE-FOCUSED MEDICAL SCHOOL IN LONG ISLAND WILL COMPLEMENT THE MORE SPECIALTY-FOCUSED NYU SCHOOL OF MEDICINE IN MANHATTAN.

ACHIEVEMENTS

Spotlight on Perlmutter Cancer Center

New $75 Million Gift Establishes Center for Blood Cancers

Gareth Morgan, MD, PhD (left), will serve as the center's director of multiple myeloma research. Faith Davies, MD (right), will serve as director of the clinical myeloma program.

EARLIER THIS YEAR, the Laura and Isaac Perlmutter Cancer Center at NYU Langone Health received a transformational philanthropic gift of $75 million, made by an anonymous donor, to establish a Center for Blood Cancers. In addition to strengthening multiple myeloma research and care, the new center will expand services for all patients. It will also bolster research efforts focusing on clinical trial recruitment and efforts to identify markers for different cancer types to recognize blood cancers at their earliest stages. Lab space and cell processing within the Center for Blood Cancers will be increased considerably, and infusion and exam rooms will be added to ensure efficient patient flow. Enhanced educational opportunities in this area will now be available as well for students, fellows, and faculty at NYU School of Medicine.

Already, two new faculty members—Gareth Morgan, MD, and Faith Davies, MD—have joined the center. Previously based at the Myeloma Institute at the University of Arkansas, they will jump-start NYU's basic, translational, and clinical research in multiple myeloma, a disease whose treatment has seen major progress over the past 15 years but that has not yet seen a cure.

"There is a pressing need for more research in the areas of early diagnosis and prevention of blood cancers," says Benjamin G. Neel, MD, PhD, director of Perlmutter Cancer Center. "As a nationally recognized cancer center, we are proud to continue to be on the leading edge of research and clinical care in this area."

Photos: Andrew Lichtenstein

Perlmutter Cancer Center Recognized as Comprehensive Cancer Center by NIH

IN FEBRUARY, the National Cancer Institute of the National Institutes of Health, the nation's leading authority in cancer research and support, designated the Laura and Isaac Perlmutter Cancer Center at NYU Langone Health a "Comprehensive Cancer Center."

Only 50 cancer centers across the United States have earned this impressive distinction. In addition, the Perlmutter Cancer Center received an overall "outstanding" rating on the competitive renewal of its Cancer Center Support Grant, which will provide $19.9 million in new funding for research programs, infrastructure, and technology. This represents a 51 percent increase from its last grant, one of the largest increases for any cancer center.

The NCI Comprehensive Cancer Center status is the highest ranking awarded by the National Cancer Institute. Perlmutter Cancer Center achieved this recognition by demonstrating leadership in basic, translational, and clinical research; offering the most advanced therapies and clinical trials; studying prevalence and prevention strategies across diverse populations; and educating future leaders in the field. Over the past five years, Perlmutter has seen a 110 percent increase in new patients and has more than doubled the number of patients enrolled in clinical trials. It also has recruited more than 20 nationally and internationally renowned faculty members into leadership positions.

Biggest Turnout Ever at Alumni Brunch in Florida

In February, nearly 100 alumni gathered for brunch at the Boca Beach Club, marking the highest attendance at a regional event. Anthony J. Grieco, associate dean for alumni relations and academic events, and Ariel Ostad '91, president of the Alumni Association, addressed the group, which included graduates from the classes of 1948 through 2011.


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1. Jonathan Vafai '04, class reunion chair, Michael Tyler '11, Marc Ialenti '11, Tiago Miguel '11, Alan Nieder '97

2. Eugene Kalnitsky '54, class reunion chair, Linda Kalnitsky

3. Dr. Pierone, Audrey Grieco, and Nancy Ryoung Cho '84, class reunion chair

4. Joseph Doyle '89, class reunion chair, with his mom, Sandy Doyle

Photos: Jon Laye from Santa Barbara Photography

CELEBRATIONS

Dean's Honors Day

Dean Robert I. Grossman honors faculty members

At the 17th annual Dean's Honors Day ceremony, held in October 2018, NYU Langone Health recognized faculty members for their work in clinical excellence, education, and science with Master Scholar Awards.

MASTER CLINICIAN
Eduardo D. Rodriguez, MD, DDS (DEN '92)
Helen L. Kimmel Professor of Reconstructive Plastic Surgery; Chair, Hansjörg Wyss Department of Plastic Surgery

MASTER EDUCATOR
David T. Stern, MD, PhD
Professor of Medicine, Vice Chair for Education, Faculty and Academic Affairs, Department of Medicine

MASTER SCIENTIST
Ann Marie Schmidt, BA (CAS '79), MD '83 (pictured right)
Dr. Iven Young Professor of Endocrinology, Department of Medicine; Professor, Department of Biochemistry and Molecular Pharmacology; Professor, Department of Pathology

NYU also honored long-standing philanthropic partners Jackie and Mike Bezos with the Valentine Mott Founders Award. The Bezos Family Foundation supports initiatives based on the science of brain development in early childhood. In 2018, Clancy Blair, PhD, was named a second Bezos Family Foundation Professor in the Department of Population Health.

EVENTS

150 guests attended the Scholarship Appreciation Reception held on April 16, celebrating the School of Medicine's commitment to providing full-tuition scholarships to all MD candidates. Gifty Addae '21 (bottom left) and Evan Wilder '19 (bottom right) told stories of where they began, how they developed their passion for medicine, and their ambitious goals.

TECHNOLOGY

A New Kind of House Call

NYU's Telemedicine Reach Expands with Virtual Urgent Care

VIRTUAL URGENT CARE, a new program launched to the public in 2018 through the NYU Langone Health app, offers same-day, secure videoconferencing visits with one of 30 physicians from the Ronald O. Perelman Department of Emergency Medicine for patients, ages 5 and older, who are concerned about a minor medical condition (such as a suspected case of pink eye, a rash, or flu-like symptoms) and based in New York, New Jersey, Connecticut, Florida, or Pennsylvania.

"We know many of our patients, as well as staff members, live outside the state of New York," says Paul Testa (Res. '08), chief medical information officer. "This is an important step in making the convenience of Virtual Urgent Care accessible to members of the NYU Langone Health community in the morning and evening when they may be home in New Jersey, Connecticut, or New York."

Patients are often surprised by just how much a virtual exam feels like an office visit, notes Viraj Lakdawala, MD, director of telemedicine in the Ronald O. Perelman Department of Emergency Medicine. "We can tell a lot by observing how the patient is breathing, how much they are sweating, how flushed their face is, and how lethargic they seem," Dr. Lakdawala explains. "If they point the camera on their smartphone at the back of the throat, we can see whether the tonsils are inflamed."

As with an in-office visit, the doctor will review the patient's medical history and symptoms and determine a treatment plan to help the patient feel better. If needed, the doctor can also order prescriptions, labs, and imaging or refer the patient to an NYU Langone Health specialist for follow-up.

"This model of care allows NYU Langone to offer patients an extremely convenient, high-quality option that they can access from anywhere," says Robert J. Femia, MD, chair of the Department of Emergency Medicine.

LEARN MORE
866-262-6458
bit.ly/nyuvirtualcare

ACHIEVEMENTS

NYU Langone Health Named Healthcare's Most Wired

FOR THE SECOND year in a row, NYU Langone Health has been recognized with a "Most Wired" award for its innovative use of technology to improve the patient experience and streamline administrative processes. NYU Langone was honored for its work in integrating strategic technology into its everyday operations.

At NYU, patients increasingly have more real-time access to their providers and their personal health records through MyChart, the electronic patient portal that allows users to view lab test results, communicate with members of their healthcare team, manage appointments, receive notifications of preventive care needs, book imaging appointments, and request prescription refills.

The award, now in its 20th year, is given to recipients on the basis of survey results from hospitals and health systems across the United States. It was issued by the American Hospital Association until 2019, when the College of Healthcare Information Management Executives (CHIME) took over the program.

RESIDENT NEWS

First-Year Resident Named to *Forbes* "30 Under 30" List

RUSHI TALATI, MD, MBA, a first-year resident physician at NYU School of Medicine, was recently recognized in *Forbes* magazine's annual "30 Under 30" list. Placed in the highly competitive law and policy category, Dr. Talati was honored for his work at the Centers for Medicare and Medicaid Services, where he served as the special assistant to the chief medical officer at the CMS Innovation Center; he managed a broad policy portfolio as one of the youngest senior advisors on staff.

Notably, Dr. Talati helped lead an overhaul of Medicare's physician payment system from fee-for-service to fee-for-value. As senior author, he articulated the federal government's position on bundled payment initiatives in a letter published in the *Journal of the American Medical Association*. He also helped structure and negotiate innovative drug pricing contracts with pharmaceutical companies to lower prescription drug costs and led an interagency task force to mobilize the federal government's response to the opioid crisis. His team crafted parts of the Support for Patients and Communities Act, which was signed into law with bipartisan Congressional support and which boosts access to addiction treatment for Medicare and Medicaid patients.

"Working at CMS gave me unique insight into the levers that will bend the healthcare cost curve in our country," said Dr. Talati. "But there's no replacement for the frontline experience that comes with being a medical resident, and I'm excited to be a better-informed steward of policy for it."

Dr. Talati received his undergraduate degree in mechanical engineering, with honors, from Stanford University. He earned both his MD and his MBA from Northwestern University with Beta Gamma Sigma honors as a Kellogg Scholar.

STUDENT NEWS

MD-PhD Student Wins Nemko Prize in Cellular or Molecular Neuroscience

LATE IN 2018, William J. Muñoz-Miranda '19, PhD (GSAS '17), a student in the MD-PhD program, was honored with the 2018 Nemko Prize in Cellular or Molecular Neuroscience from the Society for Neuroscience (SfN) for his development and application of a method to record interneurons deep in the cerebral cortex and identify both their morphology and their function. The Nemko Prize recognizes a young neuroscientist for authoring a PhD thesis that advances the understanding of molecular, genetic, or cellular mechanisms underlying higher brain function and cognition.

In his thesis, "Studies on the Dynamics of Dendritic Inhibition of the Neocortex," Dr. Muñoz, shown at left with Richard Huganir, sought to develop an experimental strategy for examining the functional architecture of the cortex in awake, behaving mice. The method he developed, called channelrhodopsin-assisted patching, allows scientists to record the activity of specific cell types in the brain at any depth in both anesthetized and awake mice. Using the innovative method he introduced, Muñoz discovered a family of somatostatin-expressing inhibitory neurons that have distinct patterns of activity during behavior and target different parts of the dendritic arbor of excitatory neurons. His work suggests a new mechanism by which the cerebral cortex can process and integrate separate information lines and sort out the information that is relevant at any point in time.

"SfN congratulates Dr. Muñoz on his remarkable PhD thesis and accomplishments to date," SfN President Richard Huganir said. "The method he developed for recording cortical neurons in behaving animals has already been adopted by colleagues in the field and will continue to lead to new insights into the structure and function of the cortex."

Photo: Joe Shymansk / Society for Neuroscience

2019 Match Day

ON MARCH 15, NYU School of Medicine's 178th class gathered with family, friends, and advisers at Riverpark in Manhattan and learned their residency placement. All 148 graduating students who applied to a residency matched.

"NYU School of Medicine has a great track record of placing its students at remarkably strong residency programs," says Linda R. Tewksbury '90 (Res. '93), associate dean of student affairs at NYU School of Medicine. "We're so proud and excited for all of the students who matched with such amazing programs around the country and at NYU Langone Health."

Admissions Surge

After NYU School of Medicine announced last summer that it would offer full-tuition scholarships to all students, applications skyrocketed by 47 percent. There is also evidence that the diversity of the applicant pool is significantly increasing.

APPLICANT POOL CLASS OF 2019

Year-over-year increases in application numbers:*

47%
following announcement of tuition-free initiative

102%
Individuals who self-identify as a member of a race or ethnicity that is underrepresented in medicine

142%
Individuals who self-identify as African American or black

ACCEPTED CLASS OF 2019

3.95
Median GPA

522
Median MCAT (99th percentile)

*Note: Data correct as of May 2019.

Reunion 2019

MORE THAN 230 alumni attended the 2019 NYU School of Medicine Reunion in May, honoring milestone classes ending in 4 and 9 with special recognition for the 50th anniversary class of 1969.

Dean and CEO Robert I. Grossman, MD, presented achievement awards to Alan F. Schatzberg '68 (Kenneth T. Norris, Jr. Professor of Psychiatry and Behavioral Sciences at Stanford School of Medicine), who received the Solomon A. Berson Medical Alumni Achievement Award; and John Inou Hwang '12 (Res. '15) (assistant professor, Department of Medicine at NYU Langone), who received the Julia Zelmanovich Young Alumni Award.

Alumni took part in student-led campus tours and the annual Reunion Ball and heard presentations from Marc M. Triola, MD '98 (Res. '02), associate dean for educational informatics and founding director of the Institute for Innovations in Medical Education; and Yvonne W. Lui (Res. '04), associate professor, Department of Radiology, and associate chair for artificial intelligence, Department of Radiology. "AI is poised to disrupt our society in our everyday world and across disciplines," Dr. Lui said. "We are developing and adapting this data-rich field, helping patients through image acquisition, image reconstruction, lower dose radiation, all with an eye toward being safer for patients."

The Office of Development and Alumni Affairs extended a special thank you to all the class chairs and to alumni who made a commitment of nearly $900,000 toward scholarships.

Watch for information on Reunion 2020 celebrating classes ending in 5 and 0: contact alumnirelations@nyulangone.org or visit med.nyu.edu/alumni/events-reunions

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Photos: Alan Barnett

1. Class of 1969 celebrating their 50th anniversary

2. Tour guides Philip Lin '22 and Malika Wilson '21

3. Alumni Achievement award winners Alan F. Schatzberg '68 (second from left) and John I. Hwang '12 (second from right) with Anthony J. Grieco '63, Dean Grossman, and Dr. Steven Abramson, vice dean for education, faculty, and academic affairs

4. Dr. Marc Triola speaks about innovation in medical education

5. Dr. Yvonne Lui presenting on AI

6. Dr. Grieco with Risa Hoshino '14

7. Ariel Ostad '91 with members of his graduating class

BOOKS

New from Faculty and Alumni Authors

Look no further for summer reading

In ***Sicker, Fatter, Poorer***, Leonardo Trasande, MD, MPP, a professor in the Department of Pediatrics, Environmental, and Population Health at NYU Langone Health, exposes the chemicals that disrupt our hormonal systems and damage our health in irreparable ways, showing where these chemicals hide—in everyday household items, schools, worksites, food, and countless other places—as well as the workings of policy protecting the continued use of these chemicals in daily life. Drawing on extensive research, Dr. Trasande outlines dramatic studies and emerging evidence about the rapid increases in neurodevelopmental, metabolic, reproductive, and immunological diseases directly related to the hundreds of thousands of chemicals that people are exposed to every day. Read an excerpt:

This book is an extension of my commitment to ensure that everyone has the opportunity to understand the long-term threat of chemicals and their relationship to endocrine disruption. I also hope to grow your appreciation that, though it's hard to measure the risks in the now, many chemicals have the power—and the tendency—to show up down the road, when it's often too late. In fact, that's why this book is both so timely and so pressing. The longer we wait to act, the longer we wait to truly take the power we do possess as citizens, to change our own habits and ultimately affect governmental policy, the more the danger grows. It can impact our own health and the long-term health of our children and grandchildren. Many health risks may not be crystal clear right now; however, the science itself is quite clear, pointing to illnesses, an increase in obesity, and shockingly the loss of IQ points that translates to a decrease in one's ability to earn money.

In ***Find Freedom Fast***, Robert T. London, MD (Res. '74) demonstrates how to quickly manage commonly seen mental health problems such as anxiety, phobias, PTSD, and insomnia with less long-term therapy and few or no medications. In the book, Dr. London outlines his three-step LPA (learning, philosophizing, action) method; LPA works by taking a focused look at the problem, challenging the thinking that caused it, and learning new behaviors and strategies to find relief quickly. Read an excerpt:

In some cases, [the definitions found in the *Diagnostic and Statistical Manual of Mental Disorders*] leave out or misattribute key symptoms, because the DSM's diagnostic labeling is often simplistic and one-dimensional. It does not take into consideration such essential factors as a patient's environment, support system, or personality type in order to give an accurate assessment. We are all individuals—our lives, our emotions, our personalities, and how we may process information through our nervous systems are different. No two of us are the same, and each and every diagnostic label can differ from person to person….

Yet, while the DSM's accuracy is debatable, countless patients or clients of mental health professionals are nevertheless categorized by its standards—so much so that it's often referred to as the "bible" of psychiatric illnesses. But it is far from a bible of any sort. At best, it's a guidebook. Some have called it a dictionary, as it attempts to classify multiple mental disorders, but includes far more subjective thinking than scientific validation. It takes a top-down approach, using a checklist of symptoms in a one-dimensional manner, as opposed to a bottom-up assessment, which would look at the multiple factors in a person's life and background, and factor them as well as the symptoms, and then, on that, make a diagnosis.

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For additional information, visit: http://bit.ly/HealthSciencesLibrary

High Tech High Touch

How do technology and innovation inform what physicians do? Even as doctors and surgeons train, adopt, and adapt, the tools that serve them best are changing even faster. Our readers shared their interest in learning more about these tools: how their peers use them, what works, and what gets in the way of providing outstanding care. Here are three alumni who are taking new approaches to making us whole—and ensuring that artificial intelligence, big data sets, and 3D printing reflect and respond to humanity.

And coming up in the fall issue: How tech and innovation are enhancing—and being taught in—the SOM curriculum.

Illustrations: André da Loba

The only tech constant? It's change

Henry Feldman '01 (Res. '04), FACP, FHM, on the ever-evolving nature of innovation and how doctors can harness AI to enhance their own practices

BY **SARAH M. JACKSON**

IF YOU DON'T ALREADY AGREE that technology is one of the most important tools in modern medicine, just spend a little time with Dr. Henry Feldman.

"It's a really exciting and powerful thing," he says with a smile. "We're actually changing the way the world works in healthcare—and we're doing it through software."

Dr. Feldman is the deputy chief medical officer for technology at IBM Watson Health, which builds massive-scale artificial intelligence (AI) solutions at the enterprise-wide or hospital-wide level. Think electronic medical record (EMR) systems that help doctors spot trends in a patient's health information, or reports that generate instant critical decision support when clinicians need it most.

Dr. Feldman also teaches clinical informatics at Harvard Medical School and Tufts University's Cummings School of Veterinary Medicine; sees patients as a hospitalist and nocturnist at Beth Israel Deaconess Medical Center in Boston; and previously served as the chief information architect in the Division of Clinical Informatics. One of his cornerstone projects at Beth Israel Deaconess was revamping PatientSite, the nation's first online patient portal, as a mobile-friendly resource enhanced with AI features. Dr. Feldman's first career, before attending medical school, was in software development for the private sector.

With such deep experience at the intersection of technology and medicine, Dr. Feldman is uniquely qualified to help lead a sea change in how technology improves healthcare delivery, the ability of clinicians to make the best decisions, and patient outcomes.

Dr. Feldman in Cambridge, Massachusetts, Spring 2019

Photo: Len Rubenstein

AHEAD OF THE CURVE

As a medical student and resident at NYU, Dr. Feldman created software for the school and medical center, then completed a medical informatics fellowship at Bellevue Hospital.

"You'd hear a lot about the history of innovation at Bellevue, so doing something new and different there wasn't considered weird at all," Dr. Feldman recalls. "In fact, you were encouraged to do independent work and push innovation. It was neat to be able to explore. Plus, I had the computer science background to develop software, which at the time was very rare."

Although it may feel foreign now, all signs indicate that AI will become as common as stethoscopes and tablets.

Photo: Len Rubenstein

The entrepreneurial thinking ingrained in Dr. Feldman during his time at Bellevue ultimately spurred headlines in 2011, when he and his hospitalist colleagues caught the attention of national media outlets for incorporating a new technology into clinical care at Beth Israel Deaconess.

That revolutionary device? An iPad.

"I was called the iDoctor for a little while. You have no idea what that was like," Dr. Feldman recalls with a laugh between coffee sips at a café in Kendall Square, the tech hotbed of Cambridge, Massachusetts. "When my division chief heard 'iDoctor,' she said, 'An ophthalmologist?' I told her, 'No, little "i," like your iPhone.' She said, 'Ah. That makes more sense.'"

The media and medical communities' initial reactions to the now-ubiquitous iPad may seem exaggerated today, but Dr. Feldman appreciates that innovation—particularly in clinical practice—invites scrutiny and healthy skepticism.

"When the stethoscope came out in the 1800s, it was going to destroy the intimacy of the doctor-patient relationship," Dr. Feldman explains. "Doctors used to put their head on patients' chests. So when the stethoscope was invented, there were rabid editorials at the time saying that the inventor was destroying our relationship with our patients. Today, what's the symbol of a doctor or nurse? The stethoscope around their neck."

AI is emerging as the next transformational tool in healthcare. Although it may feel foreign now, all signs indicate that AI will become as common as stethoscopes and tablets.

AI: THE TASK MASTER

Artificial intelligence, broadly speaking, enables machines to learn, both in real time and from previous experience. Highly sophisticated mathematical algorithms, vast amounts of electronic information ("big data"), and enormous computing power have made AI applications possible in daily life—for example, Facebook's

"We're actually changing the way the world works in healthcare—and we're doing it through software."

ability to identify people in photos or Uber's instant estimations of a ride's arrival time.

These task-specific AI functions are very similar to the ways in which the technology is being deployed in the medical setting. "We don't have a generalized healthcare AI; we have AI around a specific task—say, adverse event prevention, choosing a medication, selecting the best chemo regimen, or having a computer read and interpret pathology slides or X-rays," Dr. Feldman says.

A RADIOLOGY ASSIST

Dr. Feldman notes that the automation of medical tasks may have a negative effect on some professionals. "There have been a bunch of articles recently saying that students aren't going into radiology, for instance, because they're worried they're going to be replaced by a machine vision algorithm," he says.

"I think that, instead, AI will help the radiologist focus only on the abnormalities much more quickly," Dr. Feldman continues. "If you're looking at a thousand X-rays in a day, I imagine your brain starts to melt by the end of the day. But the AI never gets tired. It'll never not want to look at a CT scan. And, by the way, it can look at many of them at the same time, pre-process them, and prioritize critical findings for the radiologist to review."

In other words, Dr. Feldman believes that AI will be used not as a blanket tool that replaces human experts, but rather as highly task-specific augmented intelligence: a sophisticated, tireless tool that helps doctors do their jobs more efficiently, effectively, and precisely.

PREVENTING ADVERSE HEALTH EVENTS

Another way that AI can augment doctors' expertise is by identifying health problems before they start, finding signals in the noise virtually unnoticeable to humans that may indicate a patient's imminent adverse event.

"With sensors and AI, we can start detecting rare, subtle events," Dr. Feldman says. "If

AI will be used not as a blanket tool that replaces human experts, but rather as highly task-specific augmented intelligence.

last shift the patient's blood pressure was 120 over 80, and now it's 110 over 80, is that really a change? To a human, the answer may be not really. But AI might look at that trend and say, 'Of the last 1,000 patients I saw go from 120 to 110, if next shift they're at 90, their chance of having an event is 92 percent.' That's what current task-specific AI does very well. Because again, it's not frightened by having many variables. And it's relatively easy to implement."

By catching otherwise undetectable signs early, AI gives doctors the option to intervene with treatments that could halt or prevent adverse events altogether.

STRENGTHENING PATIENTS' TRUST

Dr. Feldman believes that AI will also help doctors engender more trust in the healthcare system by supporting their recommendations with highly relevant data. He offers a hypothetical example: AI can instantaneously scan 80,000 peer-reviewed genomics papers and identify the four that apply to the specific decision a doctor is making about his or her patient's course of treatment.

"The doctor will be able to inform the patient. 'Here are the four articles I'm basing my thought process on. These were surfaced by our AI system and appear to be highly supportive of (or against) this specific therapy.' I think we're going to see this sort of AI support more and more because it can handle vast amounts of data from any field—oncology, genomics, you name it. No human can possibly stay on top of this information, but a computer isn't limited by sheer volume."

PEOPLE FIRST

Although AI holds exciting possibilities for transforming healthcare, Dr. Feldman stresses that people will always remain central to the work—that combining human experts with the latest in technology is critical to creating valuable, useful products.

"Working with the exceptional PatientSite team at Beth Israel Deaconess, I came to understand how technology molds the humans around it—and how humans mold the technology," he says. "That perspective has really helped as I've come to IBM because humans are at the core of what we do. The AI is directly influenced by experts' input and perspectives."

He cites IBM Watson Health's HOPE (Health Officers Pursuing Excellence & Evidence) Team as a prime example of deeply embedding the practitioner's perspective into a new AI tool. "The only people who can tell you how a nurse makes a decision are nurses," he says. "To build a nursing AI tool, for example, the first thing we'd need is a group of practicing nurses who can tell you what would really help them provide care, and what sorts of information they'd need to know about a patient."

The HOPE Team also often accompanies the engineers or design team to the hospital for which a new AI tool is being implemented. "We explain our products from clinician to clinician," Dr. Feldman notes. "When a doctor hears it from another doctor, or a nurse from another nurse, that's very different from an engineer doing the explaining."

DABBLE IN OR DIVE INTO TECHNOLOGY

From fellowships to light reading, a spectrum of options exist for MDs interested in learning more about the intersection of medicine and tech. Here are some of Henry Feldman's recommendations.

STARTING OUT? Consider the 10x10 course from AMIA, which is a short course (sort of a mini informatics fellowship) that will equip you with the language and concepts to talk as a peer to the informatics team. Obviously, a course over a few weeks isn't the same as a two-year formal fellowship, but it will allow you to participate in the decision-making process.

WANT TO GET HANDS-ON? Learn some simple programs. Through online courses, there are many opportunities to roll up your sleeves and play with technology. The ability to learn AI programming does require some basic understanding of programming and statistics/probability theory, but there are lots of online tutorials for learning both basic programming skills and AI programming. Almost all the tools are open source and free to use.

ALL IN? Apply for a clinical informatics fellowship. "I strongly encourage anyone to go do a fellowship in clinical informatics because the computer really is the most used instrument we have in the hospital," says Dr. Feldman. Clinical informatics is now a boarded clinical specialty under every specialty. (There is a special pathway for pathologists.) "Every day all specialists—whether surgeons or dermatologists—spend the bulk of their day providing care via informatics systems that they don't understand. I think as physicians we have a moral imperative to understand them so that we can help improve the most widely used medical intervention we have."

EMBRACING THE AI ERA

Although this provider-to-provider approach is important to implementing new technologies in medical care, the healthcare community may nonetheless feel trepidation.

Dr. Feldman partly attributes such hesitation to a general lack of knowledge about AI. He illustrates this point by offering a teaching anecdote from his courses at Harvard Medical School.

"I hold up an 11 blade," he says. "Every student can tell me what it is and what it's used for. Then I ask them how the computer dosed their order: how did it know to adjust the dosage for their patient? And I get blank stares."

Yet, says Dr. Feldman, surgeons and clinicians spend most of their time on the computer—not holding an 11 blade. "The computer is the ultimate medical instrument. It touches every patient at the hospital. So, physicians need to understand how to utilize it for best care for patients. You'd never accept a drug into your practice if you didn't understand how it works," he says.

Dr. Feldman believes the onus rests partly on hospital systems and corporate leaders such as IBM Watson Health to help build doctors' comfort with AI's medical applications. Generating evidence of an AI product's efficacy is key; so, too, is involving numerous clinical and research experts in the development process to ensure that the final result exceeds practitioners' needs and expectations.

At the same time, he encourages doctors to learn some fundamentals by exploring the many online resources about AI. "Familiarize yourself with what these terms mean and look at some of the examples," he advises. "When you have a basic understanding of how the tools work, you're more willing to allow them into your practice."

He likens this kind of learning to clinicians' faith in chemistry. Many prescribers may not understand how to synthesize drugs, but they generally understand and trust the process being carried out by chemists. "Similarly, if we have a sense of what AI can do, then we can express legitimate concerns when someone tells us to use a new AI product in our practice."

Dr. Feldman also encourages practitioners to reframe their thinking on AI. "Before there were EMRs, a lot of stuff used to happen on paper, like writing up prescriptions," he says. "Now, it happens magically and instantly in a computer. The steps are basically the same."

He continues, "So, when we talk about AI in someone's medical record, that's essentially a fancy formula. And oh, by the way, it's just doing the same thing that the old paper method did and old formula did, it's just doing it with more variables, because computers have access to more patient data than humans could with paper systems. Hearing AI explained this way is not quite as scary."

FACED WITH A NEW AI PRODUCT IN YOUR PRACTICE? 5 QUESTIONS TO ASK

Rather than shying away from new technology out of uncertainty, Dr. Feldman encourages doctors to arm themselves with questions that will help tease out the relevance and reliability of a new AI product for their own practice. Here are some to get you started:

1

Where did the medical professionals who helped develop this product train?

2

How did they go about designing this product to work for our medical center in particular?

3

How close was the training data set to our practice? (Or, how close are the patients the system learned on to the ones we see?)

4

What data does the system need from our practice? Do we have it, and is it easily sharable with the tool?

5

Over time, will the system learn from our practice to match our patients more closely?

"The computer is the ultimate medical instrument. It touches every patient at the hospital."

In It for All of Us

Dara Richardson-Heron '89 (Res. '92) considers the whole person while building one of the largest—and most diverse—biomedical data sets in the world.

INTERVIEWED BY **TRAVIS ADKINS**

DR. RICHARDSON-HERON, chief engagement officer and scientific executive of the *All of Us* Research Program—a cornerstone initiative of the National Institutes of Health—has more than 25 years of executive leadership and management experience in the healthcare, corporate, and nonprofit sectors. *All of Us* aims to build and utilize a massive data set to advance innovative and high-impact health research that may lead to more precise, personalized, and effective treatments and prevention strategies.

Q What are some of the questions you hope the *All of Us* Research Program will help answer?

A It's important to understand that while many research programs are disease-specific, the *All of Us* Research Program is not. In fact, the data our participants contribute will create a massive data resource accessible for researchers of all types to use in a wide variety of health studies. The data we collect in our research program may help us answer questions such as, How can we address the opioid crisis? Why are there communities that have a higher level of disease, whether it's diabetes, for example, or Alzheimer's? As a physician, I certainly hope our program will answer many of the questions that have plagued us for a long time—and more importantly, help us identify some of the best ways to decrease the disease burden that we see in the United States.

Dr. Richardson-Heron in the atrium of Bellevue Hospital

Photo: Karsten Moran for NYU

I also want to make clear that our program isn't just about genetics or genomics. We think about the whole person. The data that we collect will help us learn more about how lifestyle, environment, and biology combine to influence health and disease—information that will lead to more tailored prevention and treatment strategies in the future.

Q You've described yourself as a physician by trade and an advocate by choice. What were some of the

"Our focus is not just on racial and ethnic groups, but rural residents, seniors, people with low income or low educational attainment, people with disabilities, people with limited access to care, and sexual and gender minorities."

formative moments or experiences that led you to a career that spanned those two roles?

A My parents had uncompromising standards about our education, and they also led by example, encouraging us to be loyal to each other, to be respectful as human beings, but most importantly, to use our talents, our gifts, and our blessings to make the world a better place. So that was the beginning of my understanding that my role wasn't just to be in this world to serve myself but to serve others.

When I chose NYU for both my medical school and my residency, it was because of the incredible curriculum and the ability to experience and learn about healthcare and preventive care in one of the most diverse cities in the world—and in one of the most diverse settings in the world.

Bellevue provided me with another formative moment because it was there that I actually saw patients—many who, through no fault of their own, presented with late-stage disease; I saw huge disparities in health, and much of this was simply because these individuals had no access to healthcare. It was a tough moment for me—and a moment of inflection as well.

Q Is there a case that stands out to you as something that crystallized this moment?

A Yes. It was a gentleman who had stage IV liver cancer, and he signed out of the hospital against medical advice because he needed to get to the sweatshop to make money to take care of his family. There were so many moments like that at Bellevue that made it clear to me that change needs to happen in the medical profession.

Disease disparities are real, and I wanted to try to figure out a way not only to decrease the burden of disease, but also to be an advocate for those individuals who, unfortunately, are not able to advocate for themselves.

Q You've been outspoken in saying that to make precision medicine a reality, we need to change the system to include historically underrepresented groups in research. The purpose of *All of Us* is as much to change the way research is done as it is to make biomedical discoveries. What are some of the changes that need to happen to reach that goal?

A I recently said that you really can't have precision medicine for all of us, if all of us don't participate and aren't reflected in research. We have to make it clear to all communities why participation in a research program like *All of Us* is important. Participation in research for many people is not an easy decision to make, and with good reason. There are communities who were part of past studies that were unethical, in which researchers withheld treatment or didn't tell the whole truth about what was being studied. And some people were included in research against their will.

So we must emphasize that the *All of Us* Research Program is different. We are taking every step possible to make sure that none of the past transgressions in research are repeated. We must also make it clear that there are many protections in place to make sure that those unfortunate events never happen again.

But we have to go beyond even that. We have to help people understand that if they are not a part of the research, they may not be a beneficiary of the advances, and that's very important for people to understand. We talk a lot about health disparities, but we don't fully understand them, and we will never understand them if all of the research is done on only a small segment of the population. We must have much more diversity in research and much more diversity, not just on the basis of race and ethnicity, but in all underrepresented categories: sexual and gender minorities, those without access to care, those who do not have a high school education, rural populations, and others.

All of Us is also on the leading edge because we involve and engage our research participants in the actual research program. We call them our "participant partners." The *All of Us* Research Program is a longitudinal study that we hope will continue for 10 years (or maybe even more). We want the participant partners in our program to feel connected, to feel that they are contributing to something bigger. We've also invited research participants to serve at the highest level of our governance on our executive committee, on our steering committee, on other working groups and task forces—and they sit side by side with researchers, other clinicians, operations staff, and our team to help us shape this program. We know the work will be greatly enhanced by the diversity of opinions and ideas. What we're doing is unprecedented on so many levels, and we need all of the thought leadership in the room to help us achieve our program goals.

Q I think it's fair to say that this is a challenging project logistically, politically, and ethically. Were you excited by the idea of taking part in something so ambitious?

A I was beyond excited—and to do so at the nation's foremost medical and research institution at the National Institutes of Health was just icing on the cake. I was fortunate to be involved with the program as an advisor during its very early stages, so I've seen the program from the ground level up. To now have the ability to use my skills, my experience, my expertise as a physician, and my passion as an advocate to be a part of a national effort to advance health and healthcare is something that one can only dream of.

Q Your fellow alumnus Dr. Henry Feldman works with IBM Watson Health; he recently told us that in designing AI systems, it's very important to avoid inherent bias in the study itself. He said that the questions that are asked, and the way the data is annotated—what gets included and what gets left out in terms of the data collected—will limit the power of AI.

A I agree with Dr. Feldman. Not only do you have to have diversity in the data, but you must also have diversity in the people who are designing the algorithms. We also have to make sure that the data sets being utilized include patients from diverse backgrounds. That's one of the biggest challenges that I see. Genomic databases in particular are not as diverse as they should be. We hope our program will provide a database that AI researchers can utilize to identify and track trends on a diverse set. That's why we have made it a priority goal for our program to enroll at least 75 percent of our participants from communities that have been historically underrepresented in research. We also want 50 percent of our participants to represent individuals from racial and ethnic minorities.

As noted earlier, our focus is not just on racial and ethnic groups, but on rural residents, seniors, people with low income or low educational attainment, people with disabilities, people with limited access to care, and sexual and gender minorities. This data will yield a much broader picture of health in the United States and also will help us move forward toward tailored and more precise prevention and treatment for all. Without question, our incredibly diverse database will be beneficial when we think about the potential use and benefits of artificial intelligence in mining large, diverse data sets.

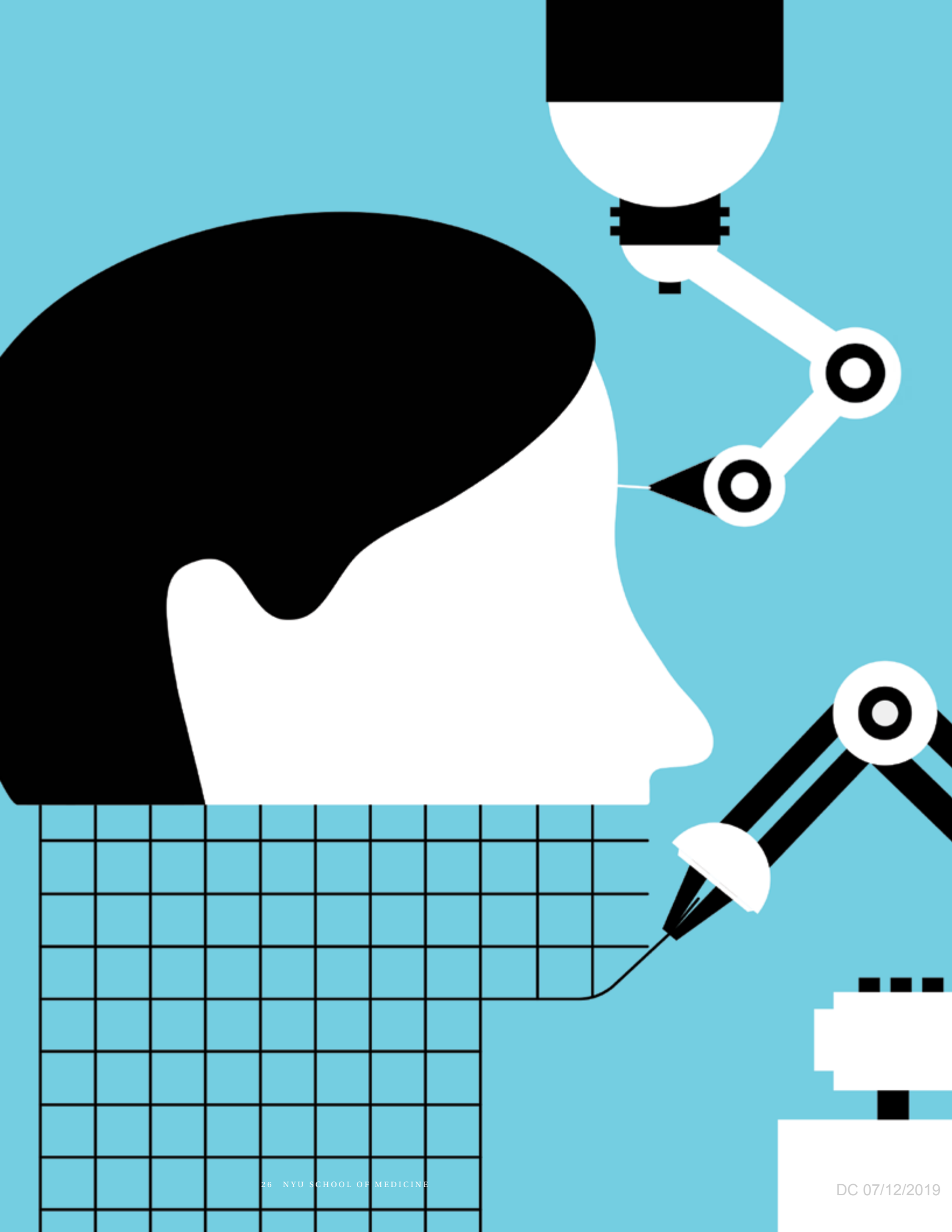
Q The harsh reality of these healthcare and socioeconomic disparities can be overwhelming to consider, yet it's your job to consider it. What gives you hope? What keeps you going?

A First and foremost, I think about all of the people who have contributed to research, people who have faced challenges much larger than this in their life and overcome them; some of the best things in life are not the easiest things in life. For me, having seen how significantly the healthcare landscape has changed just in the 20 years since my breast cancer diagnosis, in large part due to research advances, has helped keep me going. Back when I was treated, the standard treatment was basically a cocktail of three or four IV chemotherapy treatments, and one was worse than the other, but if you wanted to survive, that was it. Now there are many options, and because of research like the TAILORx study, we now know that there's a subset of women with early-stage breast cancer who may not even need chemotherapy at all—a significant advance.

Like many other physicians, I have seen the health disparities we face in our nation. Unfortunately, I've also seen loved ones die far too soon from treatable and even preventable conditions. The *All of Us* Research Program's goal is to equip physicians, researchers, communities, and individuals with more precise tools and information to promote better health and healthcare—and that's enough to give me hope. Indeed, the opportunity to be a part of this unprecedented initiative that has the real potential to change the trajectory of health and healthcare as we know it is both an honor and a privilege. That alone is more than enough to keep me laser focused on my personal mission as a physician and advocate to do everything I can to make the world a healthier and better place…for all of us!

"Our incredibly diverse database will [benefit] the use of artificial intelligence in mining large, diverse data sets."

Dr. Richardson-Heron with two NYU physicians whom she calls her mentors: **Dr. Anthony J. Grieco** and **Dr. Ruth Oratz**; Dr. Oratz, her oncologist, "saved my life," **Dr. Richardson-Heron** says.



Fit to Print

From breakthroughs in 3D printing to his work on NYU Langone's historic face transplant, Roberto Flores, MD, is making a lot of news.

BY **TRAVIS ADKINS**

BY ANY STANDARD, ROBERTO FLORES '01 (RES. '04, '07) is having a pretty good year. Dr. Flores, who is the Joseph G. McCarthy Associate Professor of Reconstructive Plastic Surgery in NYU Langone Health's Hansjörg Wyss Department of Plastic Surgery, has been part of two extraordinary surgical endeavors that are expanding definitions of what is possible. In January 2018, working with Eduardo Rodriguez, MD, and a team of dozens, he helped perform the most extensive face transplant in history; then, with his colleagues Paulo G. Coelho, DDS, PhD, and Bruce Cronstein, MD, he made significant progress in a study that could one day transform treatment for children born with skull deformations.

And fortunately for one particular patient, amid all those milestones and monumental developments, Dr. Flores found the time for a medical first of a more intimate kind. Pamela, a 30-year-old woman who had lost an ear after being attacked by a pit bull, had come to Dr. Flores to have the missing ear reconstructed—a difficult procedure, but one in which Dr. Flores is a foremost expert, having performed it more than 40 times. But Pamela had a particular request that would test the limits of his expertise.

"She wanted to be able to wear an earring in her earlobe," says Dr. Flores. It might seem simple enough compared to the task of reconstructing an entire ear. Yet, as Dr. Flores explains, reproducing—from nothing—an earlobe strong and supple enough to be pierced presented enormous difficulties. "If you open a plastic surgeon textbook and look up ear reconstruction, there's a lot of things it will show you, but the earlobe it won't," he says. "No one's figured out a good way to do it yet."

It may be time to update those textbooks. Dr. Flores gave Pamela her wish: he pierced her new ear—reconstructed with the help of an innovative three-dimensional (3D) printed model—just in time for her to wear her favorite earrings to her 31st birthday celebration. Taking cartilage from Pamela's ribs, Dr. Flores used the model of her good ear to whittle and form a new structure, which was covered in her own skin, and

Dr. Flores holds up a face mask that was manufactured at NYU leveraging the expertise of his team using 3D printing.

Material is printed onto a platform, and the printer repeats the process until thin layers stack up into a three-dimensional object, which is then superheated into its final ceramic form.

Photo: Matthew Septimus

"The face is a big part of our personal identity; when the face is restored, you're restoring the sense of self."

ultimately restored her missing ear. "I'll finally be back to myself," she told the *New York Post*.

"There is an intimacy and responsibility that comes with facial reconstruction," says Dr. Flores. "The face is a big part of our personal identity; when the face is restored, you're restoring the sense of self."

PRINT-AND-GROW BONE TISSUE

Dr. Flores's use of 3D printing technology came about as a result of his collaboration with Dr. Coelho and Dr. Cronstein, a joint effort that recently received a major grant from the National Institute of Child Health and Development (NICHD).

As the director of the Wyss Department's cleft lip and palate program, Dr. Flores specializes in performing reconstructive surgery for children born with conditions that cause extreme craniofacial differences, such as cleft palate, cleft lip, and Pierre Robin syndrome. More than 60 percent of the patients he sees are children with these conditions. For many, the standard of care involves bone grafts, treatments that have a number of drawbacks and that are not possible for those whose defects are too large, or too complicated in shape, to be replaced with endogenous bone.

Classic plastic surgery principles dictate that one should reconstruct the face by repurposing tissue from other parts of the body—"replacing like with like." But that principle has drawbacks; the body is not a limitless repository of bone, and donor site morbidity can be significant.

Left to right:
Paulo G. Coelho, Roberto Flores, and Bruce N. Cronstein

"Sometimes I know that I can take patients to a place where they feel restored, and it may even be difficult to tell if they even had any surgery," says Dr. Flores. "But there are other patients whom I cannot take where they deserve to be—I can only offer improvement. The state of the art in plastic surgery has its limits. That ceiling has been my driver."

Given his determination to discover a better treatment for his patients, it was perhaps inevitable that Dr. Flores would cross paths with Dr. Cronstein, the Dr. Paul R. Esserman Professor of Medicine, and Dr. Coelho, the Dr. Leonard I. Linkow Professor at NYU College of Dentistry and a professor in the Wyss Department of Plastic Surgery. Their work has produced some of the most remarkable advances yet in the still-evolving field of tissue and bone regeneration.

Prior to their collaboration with Dr. Flores, Dr. Coelho and Dr. Cronstein had won multiple National Institutes of Health grants for their research, which harnesses 3D robotic printing—a technology that has only recently started to be applied in medicine to "print out" organs and other body parts—to create tissue and bone implants. The printer extrudes a gel-like material composed of beta-tricalcium phosphate, a compound of the same chemicals found in natural bone, onto a platform; the printer repeats the process until thin layers stack up into a three-dimensional object, which is then superheated into its final ceramic form.

Crucially, unlike other experimental bone implants, the one that Dr. Coelho and Dr. Cronstein have developed stimulates the body to regenerate endogenous tissue. The implanted scaffold is gradually resorbed into the body and replaced by real bone, thanks to a unique approach that includes a coating of dipyridamole, a blood thinner shown in other experiments to speed up bone formation by more than 50 percent. The ceramic implants are constructed to more closely resemble real bone shape and composition than other implants.

When Dr. Flores learned of the work that Dr. Coelho and Dr. Cronstein had been doing, he was convinced it could be the future of his field. "I saw the histological results [of their previous experiments] and it was high quality," says Dr. Flores. "From a microscopic standpoint it looked as bone should look. I saw CT scans of animals with this bone construct, and it looked like bone. I saw how the implant started to disappear over time, which is what it needs to do. That was enough for me to say we should see how far we can go."

"WE HAVE TO GO FOR THIS"

Early on, as they began animal model experiments, Dr. Flores, Dr. Coelho, and Dr. Cronstein focused on implanting the bone in adult animals, and considered experiments in still-growing animals as a much longer-term goal. For good reason: "Doing work in growing animals is much more difficult," says Dr. Flores. "The bone has to grow and remodel as the face and skull finish growing."

Photo: Matthew Septimus

Soon into their collaboration, however, the NICHD released a grant opportunity that changed their timeline. Focused on projects that used 3D printing technology for bone and tissue regeneration for pediatric patients, the opportunity was practically designed for them.

"We just pretty much looked at each other and said 'we have to go for this,'" Dr. Flores recalls. "This one was perfect because it's bone tissue engineering, for children. This is what I live and breathe. I knew where the field was at that moment and where it should go. It just came together."

"Dr. Cronstein and I already knew that this technique could pass a higher safety profile threshold," says Dr. Coelho. But although they were confident that their approach had potential, there were still a lot of unknowns. The same bone-forming properties that make the implant so innovative also made it an uncertain fit for the biology of a growing animal. "Nobody knew what would happen if you put an implant with a bone-forming agent close to a suture in a growing skull in pediatric animal models," says Dr. Coelho. "There's very little research on this. If you fuse the sutures, you could create a problem bigger than the original bone defect."

Working nearly nonstop, Dr. Flores, Dr. Coelho, and Dr. Cronstein put together an application. "It's one thing when you're doing preliminary experiments, but it's another when you say, 'OK, we have to submit an idea supported by a comprehensive battery of tests to an agency,' and statistically we have an 80 percent to 90 percent chance of rejection," says Dr. Flores. "It puts you in a different mind-set. That forced us to be very disciplined about thinking about all our experiments."

PROMISING FUTURE

Their disciplined thinking paid off. The NICHD selected their application, and they won a $700,000 grant. The results of the studies supported by that grant were so positive—not only does the implant work in growing animals, but it also works better than in other applications, according to Dr. Coelho—that the NICHD has since given the team an additional $1.5 million to advance their research. They have completed preclinical testing and hope to begin clinical trials, which Dr. Flores will lead, within three or four years.

Already, though, the knowledge and skills that Dr. Flores has gained through working with Dr. Coelho and Dr. Cronstein are changing the way he treats patients. Just as he did for Pamela, he's used 3D printing technology for a number of other patients who have needed reconstructive surgery of the ear. Dr. Flores was among the first in his field to see that 3D printed models, which are based on scans of a patient's unaffected ear, would provide a far more detailed template for the painstaking work of carving cartilage from the rib cage into the shape of an ear than the previous approach, which was based on hand-drawn sketches.

"Tissue engineering and 3D printing are on the cusp of disrupting the field of facial reconstruction, and we're pushing closer to comprehensive human application," says Dr. Flores. "Success, however, will not be about the technology. It will be about bringing the right people together with a common vision and passion for changing medicine."

One team, one focus, one goal

"Like going to the moon." That's how Dr. Roberto Flores describes the experience of working on the team that successfully performed the most technically advanced face transplant yet attempted. Led by Eduardo D. Rodriguez, MD, DDS (Den. '92), the Helen L. Kimmel Professor of Reconstructive Plastic Surgery and chair of the Wyss Department, a team of seven surgeons, including Dr. Flores and five other resident alumni, performed the 25-hour procedure with the help of more than 100 medical professionals.

The second such procedure to take place at NYU Langone, the surgery set several significant milestones, including the shortest period of time from injury to face transplant and substantial reductions in surgical time and hospital length of stay. In addition, Dr. Rodriguez and his team used for the first time a 3D-printed mask of the face of the donor to help the donor's family feel more at ease with their decision. In partnership with a team from NYU's advanced 3D media services center, LaGuardia Studio, they made a high-resolution scan of the donor's face to create an exceptionally lifelike synthetic mask; they then laid the mask atop his stripped face and covered the edges with bandages prior to returning the donor's body to his family. Previously, a molded, hand-painted silicone mask would have been used, but the older mask quality is far eclipsed by the new technology. There are few printers in the world like the one at LaGuardia, which prints with 60,000 colors.

More than one year later, the patient, 26-year-old Cameron Underwood, has recovered well. And although Dr. Flores gained new technical skills and knowledge from the historic event, he says the most lasting lesson is simpler: teamwork matters. He credits Dr. Rodriguez's leadership for keeping the team focused and united throughout the countless hours of preparation and planning that went into the surgery.

"When the time came, we were all on point. We knew our roles and respected each other," says Dr. Flores. "There were no egos in the room. We put the most important thing first: the patient."

The team had to graft the entire middle and lower components of the donor's skull and face through the use of 3D computer surgical planning, 3D printed patient-specific cutting guides, intraoperative navigation, and intraoperative CAT scans.

Surgical planning skeleton Images Courtesy of NYU Langone Health

Heard

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'50s

BERNARD GARDNER '56, BA (WSC '52), professor emeritus of surgery at New Jersey Medical School, recently published his fourth book: *Surviving Surgery: Photographs from a Life* (Book-broker Publishers of Florida, 2018), a memoir and guide to patients about to undergo surgical procedures.

'60s

We recently heard from **RICHARD A. CASH '66**: "I am a senior lecturer on global health at the Harvard T.H. Chan School of Public Health, who began my career in 1967 when I and my colleagues conducted the first clinical trials of oral rehydration therapy (ORT) in adult and pediatric cholera patients and patients with other infectious causes of diarrhea, at the Cholera Research Laboratory in Dhaka, Bangladesh. I continued to work on infectious diseases and public health and in scaling up health programs in low- and middle-income countries. In recent years, research ethics has also been a major area of study for me. As a visiting professor in a number of international institutions in India, Bangladesh, and Japan, I expanded my interest in teaching and institution building. In 2006, I received the Prince Mahidol Award for this work on ORT and in 2011 the Fries Prize."

'70s

MARTIN J. BLASER '73 has been named director of the Center for Advanced Biotechnology and Medicine at Rutgers University, the Henry Rutgers Chair of the Human Microbiome, and professor of medicine and microbiology at the Rutgers Robert Wood Johnson Medical School. Previously, he was the Muriel and George Singer Professor of Medicine, professor of microbiology, and director of the Human Microbiome Program at NYU School of Medicine.

MARK B. TAUBMAN '78, a cardiologist, has been reappointed as dean of the University of Rochester School of Medicine and Dentistry. He will also continue his joint responsibilities as the university's senior vice president for health sciences and CEO of the University of Rochester Medical Center and UR Medicine, the university's healthcare network, which encompasses six hospitals, eight urgent care centers, and more than 225 outpatient sites.

'80s

ALAN W. DUNTON '80 was recently named to the board

of managers at Cytogel Pharma. Dr. Dunton has devoted his 35-year career to the discovery and development of new drug products, including more than 20 commercially successful prescription and over-the-counter drugs. He has led major pharma R&D and regulatory divisions and has served as the CEO and COO of public and private biotechnology companies.

LESLIE GOLD, PHD (GSAS '78), an associate professor in the departments of medicine and pathology at NYU School of Medicine, was honored with the 2018 Excellence in Translational and Regenerative Science Award from the Wound Healing Society. The award recognizes scientific work that fosters the development of cell-based and other therapies in wound healing and regenerative medicine toward clinical applicability. Dr. Gold was recognized for her research demonstrating clear movement toward clinical applications: "A Complex Mechanism Extracellular Matrix Induction by ER Chaperone Calreticulin and Tgf-β for Tissue Regeneration."

MACE ROTHENBERG '82, an oncologist, has been appointed chief medical officer (CMO) of Pfizer. In this new capacity, Dr. Rothenberg will be responsible for ensuring that individuals who receive a Pfizer medicine or vaccine, and the healthcare

(continued on page 35)

Photos of Dr. Mak: Imja Tse (top); Andrew Lichtenstein (bottom)

PROFILE

HAILEN MAK '74

A pediatric allergist and immunologist in Silicon Valley shares her passion for climbing

At Periche, 14,000 feet, on the Everest Track to Island Peak

After working 70-hour weeks for most of her life, **HAILEN MAK '74** decided to take her first vacation about 20 years ago. She summited Mount Kilimanjaro.

"After that," she recalls, laughing, "I thought, I bet I could do more of this stuff. Kilimanjaro was not difficult for me. So then I started hiking the Himalayas."

Before Dr. Mak, now 70, discovered her passion with a group of day hikers in the local Sierra Club, she didn't have time for exercise. A Chinese immigrant who came to the United States as a child, she managed her parents' grocery store throughout high school and college. As a biochemistry major at the University of California at Berkeley, she did most of her studying while commuting from San Francisco via three buses each way every day.

After graduating from NYU Medical School and completing a prestigious fellowship at Johns Hopkins University, Dr. Mak focused on her work as a physician. She founded her private practice in San Jose and joined the faculty at Stanford Medicine.

"I wasn't the smartest person or anything like that," Dr. Mak says. "I just always tried to do the best I could do. I just kept climbing."

Both personally and professionally, Dr. Mak's dedication paid off. In addition to becoming a highly sought-after pediatric allergist and immunologist in Silicon Valley, she became an expert hiker. Since Kilimanjaro, she has climbed many mountains in China, Tibet, Nepal, and Europe. She even scaled Island Peak in eastern Nepal, which rises 20,305 feet and has an ice wall 600 feet high. Out of the group of 20 climbers she traveled with, Dr. Mak was one of only three—and the only woman—to reach the top.

"It is not because I am strong," she says. "It is because of my mental toughness. It was very hard up there. I was short of breath. I even had a panic attack. But I'm a doctor. I checked my pulse and I knew it wasn't altitude sickness. So I told myself I was fine and I continued."

Dr. Mak is married with two daughters, and says that her own success would not have been possible without the continuous support of her husband, a retired physicist who has always encouraged her quest for adventure. Dr. Mak, a Buddhist, told her family long ago that she wanted to give the majority of her estate to charity. And her alma mater—particularly the scholarships it offers—figures prominently in her philanthropy.

"I'm so lucky," Dr. Mak says. "And I think more people should be thankful for what they have, not entitled. I'm very grateful to NYU School of Medicine. You know, there's a Chinese proverb that says: When you drink the water, you must think of its source. In other words, you have to go back and see where you came from. For me, it's NYU."

—Jen Swetzoff

Q+A WITH FREYA SCHNABEL ’82, (RES. ’87)

The director of breast surgery at NYU Langone Health’s Perlmutter Cancer Center discusses technology and her field’s rapid transformation, and why she’s happy to be on the team.

HOW DO YOU STAY ON TOP OF YOUR FIELD?
You have to stay light on your feet. The way you learned how to do something probably isn’t the way you’ll always do it. Change is the expectation.

WHAT’S IT LIKE TO WORK IN SUCH A RAPIDLY TRANSFORMING AREA OF MEDICINE?
It’s thrilling. Over the past 20 years, we’ve seen unbelievable progress in terms of early detection, better treatment, and much better outcomes. That’s largely the product of intense investment in the United States. Don’t get me wrong: Forty thousand women a year die of breast cancer. We haven’t cured the disease. But we’ve seen an incredible amount of science, and we’ve maximized patient outcomes while minimizing side effects and co-morbidities.

WHAT DREW YOU TO THE PERLMUTTER CANCER CENTER?
There’s such tremendous energy at NYU. We have a clearly articulated vision for a way forward. Since I’ve been here, we’ve been designated a Comprehensive Cancer Center by the National Cancer Institute of the National Institutes of Health. That’s huge.

WHAT ARE SOME OF THE INNOVATIVE DEVICES YOU’RE USING IN SURGERY TODAY?
We recently participated in a pivotal trial for FDA approval of the margin probe, which is a device that supports breast-conserving surgery by using radio frequency spectroscopy in the operating room. So after you perform a lumpectomy, it signals in real time if you need to take a little bit more tissue. Before this device was used, about 20 percent of patients who had lumpectomies would need second operations to remove additional tissue. But now, with this device, we have significantly lowered the re-excision rate.

Another recent technical innovation is a wireless device called Scout that uses radar technology to locate non-palpable breast abnormalities during surgery. Previously, a radiologist had to localize those abnormalities for surgery by inserting a long wire into the breast on the same day as surgery. But with this new method, we can insert the smaller chip on a different day than surgery. We’ve been using it for almost two years,

Photo: Andrew Lichtenstein

since participating in the initial trials, and it's much more patient-friendly.

WHAT'S NEW IN YOUR RESEARCH EFFORTS?
One of the fabulous things about being at NYU is having access to people from a variety of disciplines so we can really collaborate as a team. For example, I've been fortunate to work with Matija Snuderl, MD, who's the head of molecular pathology, on a deep-dive look at triple-negative breast cancer. We're hoping to get the funding soon for a whole genome sequencing and whole exome sequencing, looking specifically at the triple negatives as a population, and then couple some of that information with our cancer databases. There's a lot to think about in terms of how to use advanced molecular techniques to better understand the nature of the breast cancer and the nature of the patient.

WOULD YOU SHARE A BIT MORE ABOUT YOUR DATABASES?
When I joined NYU from Columbia, we started a longitudinal database for patients with breast cancers who were newly diagnosed and treated here. We also established a parallel database for patients who were at high risk, whether because of family history, genetic mutations, or other high-risk conditions. This has provided us with a much more powerful research tool. We can now match tissues in our tumor registry with more details about a patient's story—for example, how they were treated and their long-term outcomes. We're also collaborating with other cancer centers on what variables we're looking at, so we can share more data over time. We recently did a study looking at the tumor characteristics of people who have genetic mutations in genes aside from BRCA-1 and -2. When projects like these can be done with teams at a multi-institutional level, we can provide more significant amounts of data. I believe this is part of how we can continue moving the field forward.

WHEN YOU REFLECT ON YOUR CAREER SO FAR, WHAT MAKES YOU PROUDEST?
My patients. I've learned something from every patient I've taken care of, from every experience. And I've been taking care of some of my patients for more than 10 years. They tell me about their children graduating from high school or getting married, and we marvel at these moments they could hardly even imagine when we met. It's remarkable.

PEOPLE MUST BE GRATEFUL TO YOU.
When people whom we've taken care of express gratitude, my response is always the same: I'm happy to be on the team. Yes, I'm doing something good. But I'm a part of it. Everybody's participating: the patient, the oncologist, the radiologist, and many others.

WHY DID YOU DECIDE TO FOCUS ON SURGERY?
I liked the technical aspects in the operating room and the quick, direct impact. People were sick; we made them better. From the beginning of my surgical rotation at NYU, I loved that. And, you know, doctors work too hard to do what they don't love.

DID YOU ALWAYS KNOW YOU WANTED TO BE A DOCTOR?
No, but I do remember being interested in science and in helping people. I grew up in Astoria, Queens, in an environment where education and achievement were encouraged. My parents were immigrants, Holocaust survivors. I went to Stuyvesant High School, in one of the first few classes that admitted girls, and then to Barnard College before NYU School of Medicine.

WHEN DID YOU BEGIN TO SPECIALIZE IN BREAST CANCER?
During my surgical oncology service, I was assigned to patients with breast cancer. From the start, it was a complex and rapidly changing field. You needed to understand genetics, medical oncology, and radiation. You also had the opportunity to develop long-standing relationships with patients. That really appealed to me. So I started focusing on it, working first in breast surgery at Columbia Presbyterian in the early 1990s and then coming to NYU in 2007.

WHAT'S THE BEST ADVICE YOU CAN OFFER TO NEW DOCTORS?
The most successful mentorship relationships are two-way streets. As I continue my career, and I'm really focused on educating the next generation of surgeons, I love when former fellows call me to ask my opinion on a case or something. I cherish that.

WHAT'S LIFE BEEN LIKE FOR YOU OUTSIDE THE HOSPITAL?
I remember when my two daughters were younger, if a school trip was on a Tuesday, they'd say: "But you operate on Tuesdays. Doesn't everyone know that?" It wasn't always easy, but I've led the life I wanted to live. And I think people should hear that most women in medicine have led the lives that they want to lead, with both a career and a family.

IF YOU COULD GO BACK IN TIME AND TELL YOUR YOUNGER SELF SOMETHING, WHAT WOULD YOU SAY?
There's never just one way to do something. Keep your mind open.

PROFILE

TIMOTHY PECK '11

The CEO and co-founder of Call9—a rapidly growing startup based in Industry City, Brooklyn—explains how he's using technology to transform the delivery of emergency care.

Photo: Karsten Moran for NYU

TIMOTHY PECK '11 has found himself in a professional role he never envisioned. An emergency medicine physician and entrepreneur, he has quickly become a pioneer in the world of telehealth and a sought-after expert in the burgeoning field.

In 2018, Dr. Peck testified before Congress in support of the RUSH (Reducing Unnecessary Senior Hospitalizations) Act, which would require Medicare to reimburse qualified skilled nursing facilities for using telemedicine and telehealth technology. And in March 2019, he demonstrated Call9's proprietary data analytics and telemedicine platform at the U.S. House of Representatives' Health Care Innovation Showcase in Washington, DC. Most importantly, Dr. Peck says, the RUSH Act will help patients receive better-quality care and avoid unnecessary transfers to hospitals—and could save customers, insurance companies, and the U.S. government billions of dollars each year.

Dr. Peck first became interested in the link between technology and healthcare as a student at NYU School of Medicine. Then, while completing his residency in emergency medicine at Beth Israel Deaconess/Harvard, he started to think about how technology could be used to flip the script on how triage is done.

"I remember wondering," Dr. Peck recalls, "What if we doctors could be with people when they're at their most vulnerable, in those initial moments of an emergency? Why couldn't you call 911 and connect with a physician sooner?"

No one seemed to have an answer, so Dr. Peck decided to find out for himself. He started researching where the majority of emergencies happen and learned that the largest percentage of ambulance transfers to the emergency room originated at nursing homes.

After completing his residency—while teaching at Harvard Medical School, working as an entrepreneur-in-residence at the Harvard Innovation Lab, and getting his master's degree in education (also at Harvard)—Dr. Peck flew from Cambridge, Massachusetts, to Silicon Valley as often as he could, sharing his concept with engineers and potential investors. He started learning more about user experience and design thinking. He applied and was accepted to the prestigious Y Combinator accelerator.

In 2015, Dr. Peck officially launched Call9. It's now a rapidly growing and well-funded startup that's poised to disrupt the practice of emergency medicine. Already, less than four years after its launch, Call9 has conducted more than 140,000 telemedicine visits, treated more than 10,000 patients in New York, and saved insurers more than $50 million.

Here's how it works: Once a nursing home partners with Call9, the company puts one of its emergency-trained first responders (usually a paramedic or an EMT) on site, to be at the bedside with patients at the moment of their acute change of condition. Call9 ensures someone is there 24/7. The first responder then connects, via the company's proprietary data analytics and telemedicine platform, to a remote emergency physician, also made available 24/7. The physician has access to the patient's electronic medical record. This system of providing care at the bedside dramatically decreases the

time it takes for nursing home residents to see an emergency physician and increases patients' survival rates.

Dr. Peck still remembers treating Call9's very first patient, Mr. D., in July 2015. The 90-year-old man with diabetes was complaining of abdominal discomfort. As soon as Dr. Peck was connected to the room via a laptop screen, he also noticed the patient's difficulty breathing and realized he might be having a heart attack. He ordered an EKG at the bedside. Minutes later, the lab test results and ultrasounds confirmed a heart attack was in progress, so the Call9 paramedic administered aspirin and oxygen.

"That proved we were able to do what I had hoped we could," Dr. Peck says. "We were able to be with our patient during his emergency, long before anyone thought of calling 911."

As a result of Call9's care, no one had to intubate Mr. D. His lungs weren't overloaded with fluid. He did go to the hospital, but he was released three days later with just 5 percent less of his heart function—happy and active and well.

"Now, we see stories like Mr. D.'s happening every day," Dr. Peck says. "And it's truly a team effort, connecting with people and building trust. We train all our physicians to make eye contact through the screen, and we train all our paramedics to put their hand on a patient's shoulder.

"It may not be the traditional practice, but we're finding creative solutions to new challenges. When I decided to become a physician, I never imagined what I'm doing today. I just always wanted to help people—and that's still what drives me. I hope my journey inspires more doctors to become entrepreneurs."
—Jen Swetzoff

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professionals who prescribe or administer them, have the information they need to make appropriate, informed decisions. Prior to his appointment as CMO, Dr. Rothenberg served as chief development officer for oncology at Pfizer. During his 10 years leading clinical development for oncology, Pfizer received FDA approval for 11 new cancer medicines. In recognition of this, he was awarded the first Craig A. Saxton Lifetime Achievement Award by Pfizer in October 2018.

DEBORAH A. DRISCOLL '83, the Luigi Mastroianni Jr. Professor and chair of the department of obstetrics and gynecology at the Perelman School of Medicine at the University of Pennsylvania, was honored with the 2017 Women's Leadership Award from the Association of American Medical Colleges. Dr. Driscoll is widely recognized as one of the world's leading obstetrician-gynecologist geneticists specializing in the care of women with genetic disorders. Her accomplishments include pioneering research of the genetic disorders DiGeorge/velocardiofacial syndrome and 22q11.2 deletion syndrome, which can result in a wide range of congenital anomalies and learning difficulties.

ELIZABETH TREHU '85, a hematologist/oncologist who currently serves as the chief medical officer at Jounce Therapeutics, has been appointed to the board

of directors at Constellation Pharmaceuticals, a clinical-stage biopharmaceutical company using its expertise in epigenetics to discover and develop novel therapeutics. Dr. Trehu has more than 16 years of management experience and previously served as the chief medical officer at Promedior.

PHILIP HARRIS '86 was recently honored by the Jewish Community Center of Staten Island for his dedication to the community with the Mitzvah Award for Outstanding Service. Dr. Harris has served as the chair of physical medicine and rehabilitation at Brookdale Hospital since 2003. He held the same position at Jamaica Hospital from 1995 to 2003. In addition, he is the medical director of Brookdale's Adult Day Care Program.

'90s

CATHY M. CRUISE '91, a physiatrist, was appointed chief of staff and acting director of the VA Northport Medical Center, Long Island's only veterans hospital. She was recently featured in *Newsday*, where she was quoted saying she'd like to stay on in her role permanently. Dr. Cruise comes from a military family and knows firsthand the challenges
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RACHEL CANNING '98 AND SOHEIL MOTAMED '98

Family vacation at Antelope Canyon, Arizona (2018)

Many graduates have fond memories of their time at the School of Medicine. But Rachel Canning '98 and Soheil Motamed '98 have memories that are a little fonder than most: it's where the two young physicians-in-training met and fell in love.

Dr. Motamed, who had just graduated from UCLA, had been granted a coveted sponsored spot at NYU's MD-PhD program. Dr. Canning had applied to several medical schools while doing research at the National Institutes of Health; she was waitlisted at NYU School of Medicine. Just two weeks before the start of the fall semester, she got a call from Admissions inviting her to join the entering class. "I packed up everything and moved right away," Dr. Canning says. "I desperately wanted to go to medical school, and NYU gave me a chance."

The two students met on the 11th floor of then-Rubin Hall. At the time, most of the medical students lived there; it was the in-house, coed dormitory. The two found they had a lot in common: the same classes and schedules, similar stressors and goals. And they shared a love of art—uncommon among their other friends—and visited some of New York City's most cherished museums on their earliest dates. "Rachel loved the Whitney. I liked the Museum of Modern Art," Dr. Motamed recalls.

But there were challenges, too. "Two medical students dating each other… it's complicated," Dr. Canning says. "You're interested in each other in all the 'normal' ways, but you're also very competitive."

By the end of his first year in the MD-PhD program, Dr. Motamed knew he was on the wrong career path. "I liked research," he says, "but I realized it wasn't something I wanted to do as a career. I wanted to focus on something much more clinical." He dropped out of the MD-PhD program, and joined Dr. Canning in the traditional MD curriculum.

Meanwhile, the couple dated throughout their tenure at NYU School of Medicine, graduating together as planned in the spring of 1998. They then moved to California, where they completed their residencies, he in orthopedic surgery at the University of Southern California, she in internal medicine at the University of California, Los Angeles. Today, the couple live in San Mateo, California, with their three children, Calvin (12), Scarlet (10), and Evan (7).

Even as their lives came together, their careers moved apart. Dr. Motamed is an orthopedic surgeon with the Mission Peak Orthopaedic Medical Group. "I always liked surgery," says Dr. Motamed, "and something clicked when I rotated through orthopedics. We don't deal with life or death as much; it's more about improving people's quality of life—which I find satisfying."

But that life/death dynamic has been important to Dr. Canning, who was drawn to palliative care. A hospitalist at Permanente Medical Group in Oakland, she has witnessed the national shift to more and more medical services being offered in outpatient facilities, as well as the general aging of the population.

"Patients who actually get admitted to the hospital now are sicker than they used to be, and they're older," she says. "Many of the people we see are at the end of their life, or getting there, and it became important to me to be able to have the kinds of conversations those patients needed to have. I don't want to put a Band-Aid on a problem that cannot be fixed; I want to help a terminal patient get to the end of their life with their family, peacefully."

— Joanna Bock

Editor's Note: Drs. Motamed and Canning served as co-chairs of the 2018 California regional alumni brunch and attended their 20th reunion last spring.

Photo courtesy of Rachel Canning and Soleil Motamed

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of veteran patients. "My father-in-law is a veteran who receives care here, my brother is a veteran, my father was a veteran," she says. "When an opening came for me to work right here, I thought [this] was my dream job."

RENATO (RENE) GIACCHI '93 (RES. '95, '99), a physician at Advocare—a group of ear, nose, and throat specialists in Morristown, New Jersey—recently grew his practice and welcomed another NYU School of Medicine graduate, Sara Immerman '07, to the team of doctors. Dr. Giacchi completed his residency and fellowship at NYU, focusing on head and neck surgery and oncology.

IVAN ORANSKY '98 has joined Medscape as vice president, editorial. Previously, he held editorial positions at *MedPage Today*, Reuters Health, *Scientific American*, *The Scientist*, and *Praxis Post*. He also co-founded *Retraction Watch*, which reports on scientific retractions, fraud, and related issues, and he serves as the president of the Association of Health Care Journalists. In addition, he is a distinguished writer in residence at New York University's Arthur L. Carter Journalism Institute.

'00s

DANIEL JOSEPH CERADINI (RES. '04, '05, '06, '09), director of research in plastic surgery at NYU Langone Health, recently led a team of scientists at NYU School of Medicine in discovering how the healing of wounded skin in diabetes can be sped up by more than 50 percent using injections of stem cells taken from bone marrow. The findings of their new study in mice, which was published in the January 2019 issue of the journal *Diabetes*, focused on a chain of events in diabetes that makes skin sores more likely to form and less likely to heal. According to Dr. Ceradini, the new stem cell therapy could help not just in healing diabetic skin ulcers but also in repairing damage to diabetes-inflamed blood vessels.

MELANIE JAY '00 (RES. '04), co-director of the Comprehensive Program on Obesity and associate professor in the departments of medicine and population health at NYU School of Medicine, gave the closing remarks at the inaugural Obesity Research Summit in November 2018. The event, which drew hundreds of participants, promoted both research and public community engagement among a broad array of internal and external experts in basic science, clinical research, population health, and data science.

JEREMIAH SCHUUR '01 has been named physician-in-chief for emergency medicine at Lifespan and chair of the department of emergency medicine at the Warren Alpert Medical School of Brown University in Rhode Island. Previously, he served as chief of the division of health policy translation and vice chair of clinical affairs in the department of emergency medicine at Harvard Medical School.

DONALD E. HEITMAN '05, an orthopedic surgeon who focuses on sports medicine and arthroscopic surgery, recently joined the Center for Musculoskeletal Disorders in New Jersey. Previously, he worked in New York City at OrthoCare Surgical and, before that, at Gotham City Orthopedics.

DAVID T. JACOBS '08, a phlebologist and vascular and interventional radiologist, recently opened South Shore Vein in Rockville Center, New York, a private practice dedicated to treating medical and cosmetic vein disease. He is the author of many articles in scholarly journals and a chapter on vascular malformations that will be included in an upcoming interventional radiology textbook.

CAROLYN SEIB '09, assistant professor in the department of surgery (general and endocrine surgery) at the Palo Alto VA and Stanford University, married Charles Eugene Le Père, who manages the artificial intelligence and augmented reality research and development programs at Jaunt XR, in September 2018 in Fairfield, California.

Alumni

NORMAN ORENTREICH (RES. '53), a dermatologist who invented hair transplantation and developed the Clinique line of products, died January 23, 2019, at 96. For more than six decades, Dr. Orentreich was an innovator in dermatology and cosmetic surgeries. He was a clinical professor at NYU School of Medicine, the first president of the American Society for Dermatologic Surgery, and an advisor to numerous medical facilities. In addition, he founded the Orentreich Foundation for the Advancement of Science in 1961, where research was conducted on aging, cancer, dermatology, and serum biomarkers. During his remarkable career, Dr. Orentreich created new treatments for skin, hair, and nail maintenance, and he invented medicines and medical devices for rejuvenating scarred and aging skin. He is survived by his children, Catherine A. Orentreich '87, David Orentreich, MD, and Sari Orentreich.

MURRAY BERENSON '61, who practiced internal medicine and gastroenterology for more than 40 years at St. Vincent's Medical Center in New York City's Greenwich Village, died February 12, 2019, at 87. In 2011, Dr. Berenson's family and friends established the Murray Berenson Distinguished Scholar in Physician-Patient Communication program to recognize his lifelong commitment to compassionate patient care. This program provides the NYU Langone Health community an opportunity to engage with a leading expert in the field of patient communication and create meaningful dialogue among faculty and physicians-in-training, with the goal of enhancing physician communication skills and improving patient outcomes through skilled clinical examination. Dr. Berenson is survived by his wife, Susan; his brothers, Joseph, Daniel, and Ronald; his children, Stephen, Jennifer, Richard, and Kathryn; and 10 grandchildren.

CAROL EDELSTEIN WEICHERT '61, a pediatrician and psychiatrist, died October 4, 2018, at 82, of brain cancer. Dr. Weichert is renowned for her early research into the psychological aspects of breastfeeding. She initially became interested in the topic after counseling mothers as a pediatrician. Dr. Weichert published numerous articles in the 1970s, and then completed her residency in psychiatry at Tufts University in the late 1980s. She served as a psychiatrist at the Boston VA hospital and later had a private practice. Dr. Weichert is survived by her identical twin sister, Susan Kluver; her brother, Joseph Elston; her daughter, Regina Weichert; her sons, Robert and Cyrus Weichert; and 10 grandchildren.

Our condolences to the families and friends who have recently lost loved ones. Please notify us of alumni and faculty passings so that we may recognize and honor our community members in future issues.

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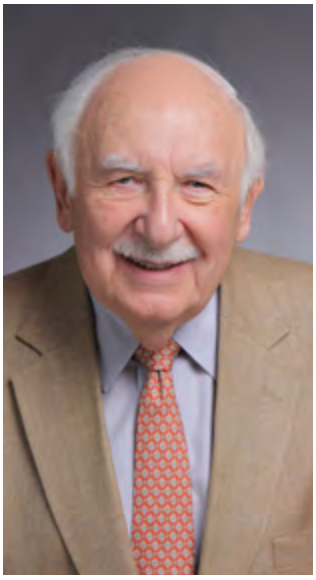
med.nyu.edu/alumni

ANTHONY C. MUSTALISH '66, BA (WSC '62), a physician in emergency medicine, died October 25, 2018, at 77, of brain cancer. Dr. Mustalish was an attending physician and associate director of the NewYork-Presbyterian/Weill Cornell Medical Center Emergency Department. He was also an associate professor of emergency medicine in clinical surgery and of healthcare policy and research at Weill Cornell Medicine. Before that, he was the deputy commissioner for New York City's Department of Health, held leadership roles at many NYC hospitals, and served in Vietnam as a captain and surgeon in the U.S. Army. He was an avid runner throughout his life, finishing his 10th consecutive NYC Marathon at age 72. Dr. Mustalish is survived by his wife, Elayne Mustalish '66 (whom he met as a fellow medical student); his children, Rachel, David, and Peter; his daughters-in-law, Margaret Mustalish and Chloe Teasdale; and four grandchildren.

Rob Strong

LISA M. SCHWARTZ '89, a director at the Center for Medicine and Media at the Dartmouth Institute for Health Policy and Clinical Practice, died November 29, 2018, at 55, of cancer. Dr. Schwartz dedicated her life to advocating for patient access to accurate, easy-to-understand medical information. In 2017, she and her husband, Dr. Steven Woloshin, were honored by the American Medical Writers Association for the articles and books they co-wrote, including *Know Your Chances* (University of California Press, 2008) and *Overdiagnosed* (Beacon Press, 2012). Dr. Schwartz and Dr. Woloshin met when they were medical residents at Bellevue Hospital Center. Together, they trained journalists to be skeptical about claimed scientific breakthroughs and miracle cures, and to better communicate the benefits and risks of medical treatments. In addition to her husband, Dr. Schwartz is survived by their daughter, Emma; their son, Eli; her mother, Heda Teitcher; her brother, Mark; and her sister, Susan Schwartz.

Faculty



MARCEL TUCHMAN (RES. '55), a resident alumnus and a member of the faculty at NYU School of Medicine for more than 50 years, died November 10, 2018, at 97. In his book, *Remember: My Stories of Survival and Beyond* (Holocaust Survivors Memoir Project and Yad Vashem, 2010), he recounted his experiences as a young man in Europe—in the Przemysl ghetto, at Auschwitz, and then as a university student in Germany—and described the people who played a role in his survival. After the war, Dr. Tuchman emigrated to the United States with his wife, Shoshana, who predeceased him in 2013. He was a resident in internal medicine at Bellevue from 1952 to 1955, and joined the faculty at the NYU School of Medicine in 1953, rising to the rank of professor of clinical medicine in 1975. In recognition of his teaching excellence, Dr. Tuchman received the Voluntary Clinical Faculty Award of *Alpha Omega Alpha*'s Delta Chapter in 2001, and the Outstanding Volunteer Clinical Teacher Award of the American College of Physicians. He is survived by his son, Peter, his daughter-in-law, and two grandchildren.

MD Alumni

ALVAH M. WEISS '41
WILLIAM N. HUBBARD, JR. '44
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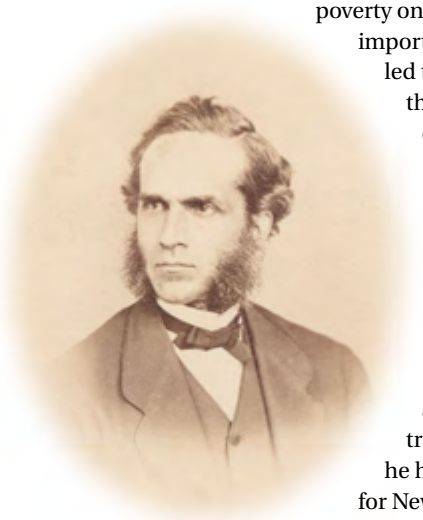
Look Back

At Bellevue, Dr. Smith (fourth from left) was a widely respected surgeon and educator, author of several surgical texts, and a vital force in promoting antisepsis and establishing the first training school for nurses in the United States. (*Bulletin of the American College of Surgeons*, December 1991)

STEPHEN SMITH (1823–1922)



Dr. Smith was the most consequential surgeon in our medical school's long history. Entering the Bellevue wards as an intern on the surgical division in 1850, he directly confronted the impact of poverty on public health. This inspired a career that included spearheading the most important sanitary inspection of a city in the history of the United States, which led to the first meaningfully empowered Metropolitan Board of Health. He then went on to found the American Public Health Association, forerunner of the U.S. Public Health Service, to promote sanitary reform on a national basis, serving as its first president. As a surgeon, he was a founder of the Bellevue Hospital Medical College and its first professor of the principles of surgery, and also served as professor of clinical surgery at the University of the City of New York (New York University). His *Handbook of Surgical Operations* was the bible of Union surgeons during the Civil War, and he later authored the authoritative textbook *Principles and Practice of Operative Surgery.* He was one of the first American surgeons to adopt Listerian antisepsis. He championed the country's first municipal ambulance service at Bellevue and the Bellevue Nursing School, the first to train educated nurses in the United States. Active until his death at age 99, he held many major public health positions including commissioner of health for New York and commissioner of lunacy, and was at the forefront of numerous public health initiatives including authoring the State Care Act that reformed care of the mentally ill. His legendary career expanded the role of a surgeon well beyond the operating room to the broadest landscape of public service.

—DANIEL F. ROSES '69
JULES LEONARD WHITEHILL PROFESSOR OF SURGERY AND ONCOLOGY

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