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ONCOFERTILITY

## Preserving the Dream of Parenthood

PAGE 2

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TRANSPLANTATION

## The First Fully Robotic Double Lung Transplant

PAGE 10

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NEUROSURGERY

## A Novel Fix for a High-Risk Aneurysm

PAGE 12

# GOING THE DISTANCE

When **Phil Passen's** aortic valve needed replacing, **Dr. Mark Peterson** offered a long-term solution that avoided blood thinners and let him resume athletic pursuits. **PAGE 20**





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TRANSPLANTATION

## The First Fully Robotic Double Lung Transplant

PAGE 10

---

NEUROSURGERY

## A Novel Repair for a High-Risk Aneurysm

PAGE 12

---

OPHTHALMOLOGY

## Advancing Shingles Eye Disease Treatment

PAGE 32

# PRESERVING THE DREAM OF PARENTHOOD

Dr. Emeline Aviki leads a Perlmutter Cancer Center program that safeguards patients' fertility while they undergo cancer treatments. PAGE 2



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ONCOFERTILITY

## Preserving the Dream of Parenthood

PAGE 2

---

TRANSPLANTATION

## The First Fully Robotic Double Lung Transplant

PAGE 10

---

OPHTHALMOLOGY

## Advancing Shingles Eye Disease Treatment

PAGE 32

# GRATEFUL FOR GREAT CARE

**Susan Joseph** survived a ruptured aneurysm and is living life to the fullest thanks to an innovative device and procedure at NYU Langone.

PAGE 12





Oncofertility

# PRESERVING THE DREAM OF PARENTHOOD FOR PATIENTS WITH CANCER



Gynecologic oncologist Emeline Aviki, MD, MBA, with one of the 40 tanks of liquid nitrogen at NYU Langone Reproductive Specialists of New York in Mineola. Each tank contains embryos, eggs, and sperm from Perlmutter Cancer Center patients undergoing cancer treatment. Cryopreserved specimens, stored at  $-321^{\circ}\text{F}$ , remain viable indefinitely.

Photograph by **Brad Trent**







When Jenna Gobrick was diagnosed with stage 3 breast cancer in August 2024, she could hardly believe it. She was just 29, a decade younger than the age at which a woman's risk of developing the disease typically begins to rise. "It's one of those things you think won't happen to you," she recalls. "I was terrified."

Surgical oncologist Melissa Fana, MD, at Perlmutter Cancer Center at NYU Langone Long Island Breast Surgery Associates—Patchogue, told Gobrick that cancer cells had spread to nearby lymph nodes. She would need chemotherapy to shrink the primary tumor before it could be removed. "I want you to start chemo yesterday," Dr. Fana said. However, before referring Gobrick to a medical oncologist, the surgeon asked an unexpected question: "Do you plan on having children?"

"I don't have a partner right now," Gobrick confided, "but I want a family of my own someday."

Dr. Fana explained that infertility is a common side effect of cancer therapies, including chemotherapy. But having a baby could still be possible, she assured Gobrick, with help from a groundbreaking program at NYU Langone Health.

Only a tiny minority of patients take advantage of technologies that can preserve their fertility before or during cancer treatment. Barriers include lack of awareness, the high cost of many fertility procedures, time constraints due to the urgent need to start treatment, and discomfort with discussing reproductive issues.

The Oncofertility Program at Perlmutter Cancer Center, a National Cancer Institute–designated Comprehensive Cancer Center, is designed to overcome those obstacles. Launched in February 2024, it offers fertility counseling, education, and access to a range of treatment options, including advanced surgical techniques available at few other institutions. Aside from clinical expertise, what

sets the program apart is its unique approach. Each patient at Perlmutter Cancer Center is given the opportunity to receive oncofertility services through dedicated nurse navigators.

"We want to optimize patients' ability to live normal lives after their cancer treatments, including having children if they wish," says gynecologic oncologist Emeline Aviki, MD, MBA, the program's physician lead. "Our goal is to ensure that every patient has seamless access to both standard-of-care and cutting-edge methods for fertility preservation."

Dr. Aviki joined NYU Grossman Long Island School of Medicine as clinical assistant professor of obstetrics and gynecology in 2023 from Memorial Sloan Kettering Cancer Center. Although the NYU Langone Fertility Center has long offered egg freezing under the direction of reproductive endocrinologist and infertility specialists Elizabeth Fino, MD, in Manhattan and Linda Sung, MD, in Long Island, Dr. Aviki set out to increase access and participation while expanding specialized services to patients across the health system. She recruited Rosemary Semler, MA, RN, a veteran oncology nurse who had led Sloan Kettering's program, to direct the initiative. Medical oncologist Abraham

Chachoua, MD, director of Perlmutter Cancer Center's Lung Cancer Center, championed the program and secured initial funding.

Under the new protocol, all patients diagnosed with cancer at NYU Langone are asked if they would like to receive fertility preservation counseling. If so,

they're referred to either Semler or Vanguie Armijo Mora, RN, the program's two nurse navigators.

A consult can be arranged within 24 hours. Navigators discuss the potential impacts of prescribed cancer treatments and options for fertility preservation. If a patient wants to proceed, they are provided referrals to related services, ranging from

Dr. Emeline Aviki (center) with Rosemary Semler, MA, RN (left), and Vanguie Armijo Mora, RN (right), nurse navigators for the Oncofertility Program.



established approaches such as egg retrieval and sperm banking to such novel procedures as uterine transposition (see "A Pioneering Surgery Protects an Aspiring Mom from Radiation," page 5) and ovarian tissue cryopreservation.

The program fosters collaboration across the cancer-care and fertility-preservation teams and provides resources for managing fertility-related costs. For instance, it partners with facilities that offer discounted rates for storing eggs and sperm and with philanthropic organizations that can assist with expenses, as well as coordinating financial aid from NYU Langone. So far, almost 250 patients have participated.

During Gobrick's counseling session, on August 22, 2024, Armijo Mora confirmed that she was a good candidate for egg freezing, walked her through the process, and advised her on navigating insurance and potential funding sources. Gobrick then met with reproductive endocrinologist Vasilios Goudas, MD, at NYU Langone Reproductive Specialists of New York—Mineola. She

began receiving daily hormone injections to stimulate egg production. On September 9, Dr. Goudas and his team retrieved 27 viable oocytes ("A very good number," he says), froze them, and stored them in liquid nitrogen tanks at a secure facility.

Soon afterward, Gobrick started a course of chemotherapy and immunotherapy prescribed by medical oncologist Francis Arena, MD, at Perlmutter Cancer Center at NYU Langone Arena Oncology and Integration. In early 2025, Gobrick will undergo surgery, and once she's ready to start a family, she'll be well equipped to fulfill her dream.

"Everyone in the Oncofertility Program has been so comforting and supportive, and they've explained things clearly every step of the way," Gobrick says. "It's a huge relief to know that whenever I need my eggs, they'll be there waiting for me."



Jenna Gobrick



FOR INFORMATION ABOUT THE ONCOFERTILITY PROGRAM, VISIT [NYULANGONE.ORG/FERTILITYPRESERVATION](https://nyulangone.org/fertilitypreservation), OR CALL 212-263-8990 (FOR MANHATTAN), 718-935-9766 (FOR BROOKLYN), OR 516-739-2100 (FOR LONG ISLAND).



# PIONEERING SURGERY PROTECTS AN ASPIRING MOM FROM RADIATION

In May and November 2024, gynecologic oncologist Emeline Aviki, MD, MBA, completed a novel two-part surgery known as a uterine transposition. For the first part, she was assisted by gynecologic oncologist Leslie Boyd, MD; for the second part, by gynecologic oncologist Deanna Gerber, MD. The procedure, which had previously been performed fewer than a dozen times in the US, temporarily relocates the uterus and ovaries to avoid damage during pelvic radiation for nongynecological cancers—in this case, a sarcoma in the patient’s tailbone.

“Young women who receive radiation for pelvic or colorectal cancers typically go into menopause and are unable to get pregnant due to radiation damage affecting the uterus and ovaries,” Dr. Aviki explains. “Those two devastating side effects can be completely avoided with this approach, which preserves hormonal function as well as fertility.”

Uterine transposition surgery is done in two separate stages. First, after the patient’s eggs have been retrieved and frozen for safekeeping, a minimally invasive procedure is performed to transect the ligaments and blood vessels surrounding the uterus and cervix, freeing them from the vagina and pelvis. The blood supply is then rerouted so that the uterus and both ovaries can be sutured to the upper abdominal wall, placing them beyond the radiation field. Once radiation therapy is complete, a second minimally invasive surgery is performed to return the organs to their original location. Several women who have undergone the procedure have later become pregnant naturally and delivered healthy babies.

NYU Langone’s inaugural patient had her uterus successfully reimplanted in November, and she plans to try to conceive soon. “Our adoption of this technique reflects our commitment not only to curing cancer, but also to ensuring that when we do, our patients’ hopes and aspirations remain alive as well,” says Dr. Aviki.

“Our goal is to ensure that every patient has seamless access to both standard-of-care and cutting-edge methods for fertility preservation.”

GYNECOLOGIC ONCOLOGIST DR. EMELINE AVIKI, PHYSICIAN LEAD OF THE ONCOFERTILITY PROGRAM

## MEET THE EXPERTS



Emeline Aviki, MD  
GYNECOLOGIC ONCOLOGY



Melissa Fana, MD  
BREAST CANCER SURGERY



Elizabeth Fino, MD  
REPRODUCTIVE ENDOCRINOLOGY AND INFERTILITY



Linda Sung, MD  
REPRODUCTIVE ENDOCRINOLOGY AND INFERTILITY



Vasilios Goudas, MD  
REPRODUCTIVE ENDOCRINOLOGY AND INFERTILITY



Francis Arena, MD  
MEDICAL ONCOLOGY



Leslie Boyd, MD  
GYNECOLOGIC ONCOLOGY



Deanna Gerber, MD  
GYNECOLOGIC ONCOLOGY



## Orthopedic Surgery

# HOW A HUMBLE HOSPITAL

As chief of orthopedic trauma in NYU Langone Health's Department of Orthopedic Surgery, Kenneth Egol, MD, understands that when a bone breaks, it knits back together with new bone tissue to form a stronger union. Last year, Dr. Egol experienced the wonder of a different kind of joint venture. A film he nurtured into existence with other collaborators, *On the Shoulders of Giants: The History of NYU Langone Orthopedics*, became a finalist for Best Documentary at the 23rd Tribeca Festival, an annual film gala in lower Manhattan that hosts more than 600 screenings.

A self-described "history buff," Dr. Egol, the Joseph E. Milgram Professor of Orthopedic Surgery, has been fascinated by his department's pioneers since his residency at NYU Langone in the late 1990s. So much so, in fact, that he led a group of residents and research students in an initiative to catalog the biographies and contributions of these clinical luminaries.

The project made Dr. Egol realize he had the ingredients for a rich documentary that would chronicle the origin, evolution, and impact of one of America's leading specialty hospitals. NYU Langone, ranked #3 in the nation for orthopedics on *U.S. News & World Report's* Best Hospitals list, trains more orthopedic surgeons than any other institution in the country. Its 200 physicians and surgeons perform more than 34,000 orthopedic procedures annually. "I was convinced there was a compelling story others needed to know," says Dr. Egol, vice chair for academic affairs, orthopedic surgery.

Enthusiastic support for the venture came from Joseph Zuckerman, MD, the Walter A. L. Thompson Professor of Orthopedic Surgery and chair of orthopedic surgery, who partnered with Dr. Egol as co-executive producer. Financial backing arrived, in part, from the department's alumni association, and



"Thousands and thousands of patients have benefited from NYU Langone Orthopedics. This film shows the trajectory of our department from a humble hospital in a Harlem brownstone to a powerhouse of innovation and influence."

JOSEPH ZUCKERMAN, MD, CHAIR OF ORTHOPEDIC SURGERY



# ROSE TO NATIONAL RENOWN



In a surgical amphitheater like the one shown here, Lewis A. Sayre, MD, the first professor of orthopedic surgery at Bellevue Medical College, pioneered surgical education. Today, NYU Langone trains more orthopedic surgeons than any other institution in the US.

creative direction emerged from—fittingly—a patient. Peter Sanders, an award-winning documentary filmmaker who had been under Dr. Egol's care for several years, most recently for a midfoot fracture, was hired as director.

Four years in the making, *On the Shoulders of Giants: The History of NYU Langone Orthopedics* spans more than 150 years over one engaging hour. The film's narrative opens with Lewis A. Sayre, MD, considered the father of orthopedic surgery in North America, who was appointed Bellevue Medical College's first professor of orthopedic surgery in 1861. Two of his trainees, Drs. Herman and Henry Frauenthal, sons of a shoemaker, started a seven-bed "dispensary" called the Jewish Hospital for Deformities and Joint Diseases in a Harlem brownstone.

The hospital eventually relocated from upper Manhattan to 17th Street and Second Avenue. In 1979, it was renamed The Hospital for Joint Diseases and, seven years later, merged with NYU Langone. Today, the hospital is known as NYU Langone Orthopedic Hospital. The film also highlights the department's place in the history of New York City and its commitment to gender, racial, and cultural diversity.

"I walked into the Hospital for Joint Diseases in July of 1984," Dr. Zuckerman recalls. "Forty years later, I'm still walking through its front door, though the landscape and my role in it have changed significantly. Thousands and thousands of patients have benefited from NYU Langone Orthopedics. This film shows the trajectory of our department from a humble hospital in a Harlem brownstone to a powerhouse of innovation and influence."



TO VIEW THE DOCUMENTARY ON NYU LANGONE'S YOUTUBE CHANNEL, GO TO [NYULANGONE.ORG/ORTHODOCUMENTARY](https://nyulangone.org/orthodocumentary).



## First Person

# LEVERAGING MATH TO UNRAVEL MYSTERIES OF MATERNITY

*"I fell in love with math when I realized how useful it is," says Liat Shenhav, PhD, assistant professor at NYU Grossman School of Medicine and NYU's Courant Institute of Mathematical Sciences. "The magic happens when I can use math to explain how the world works." Since 2023, Dr. Shenhav, a mathematician and computer scientist, has led a team of data scientists and computational biologists at NYU Langone Health's Institute for Systems Genetics, where she develops mathematical models and artificial intelligence (AI)-driven algorithms to advance maternal and child health. As part of a collaborative effort, Dr. Shenhav and her team partner with clinicians and biologists across multiple disciplines. Here, she shares insights into her innovative work.*

I'm deeply passionate about women's and children's health and the application of rigorous, data-driven approaches to its study. My research group focuses on developing technology to improve health outcomes for women and children, particularly during the pivotal life stages of fertility, pregnancy, and lactation.

Our bespoke computational methods are designed to uncover hidden dynamics that distinguish normal from pathological conditions. The lab's approach is novel. We're working to uncover hidden, biologically meaningful patterns from large data sets. There's no mouse model that can do this. You need a deep understanding of pregnancy and early-life biology, as well as the intricacies of mathematics and statistics, to design precise, translatable algorithms.

Our research centers on three interconnected areas: the human microbiome, human breast milk, and the dynamics of pregnancy.

Unlike our DNA, our microbiome, the collection of microbes living in and on our body, is dynamic and subject to frequent changes. Our research explores how the microbiome evolves over time and how these changes can cause or indicate health and disease. To this end, we develop computational methods that serve the broader microbiome community,

and apply them to elucidate the microbiome's role in the key life stages of fertility, pregnancy, and lactation.

Working on the human microbiome made me realize that we must also look at one of its critical drivers, human milk, which is optimal for growth and development. Its composition varies between mothers and changes throughout lactation. Remarkably, we know more about what's in a strawberry than what's in human milk. To address this knowledge gap, we study the ecology of human milk across diverse populations worldwide. By designing computational methods and mathematical models to study how complex biological systems work—an approach known as systems biology—we aim to understand how the components and dynamics of human milk drive early-life development and shape long-term health outcomes.

In a recent study published in the journal *Cell*, we found that much as a pacemaker regulates the rhythm of the heart, breastfeeding and human milk set the pace and sequence for microbial colonization in an infant's gut and nasal cavity, ensuring that this process unfolds in an orderly and timely manner. Our findings show that healthy microbiome development requires not only the presence of beneficial microbes, but also their arrival in the right order and at the right time, a process regulated by breastfeeding and human milk. This gradual maturation process, in turn, lowers a child's risk of developing asthma.

Another major focus of our lab is understanding the dynamics of pregnancy, specifically what distinguishes a healthy pregnancy from one that results in adverse outcomes

or disease. Preeclampsia, a pregnancy complication characterized by high blood pressure and potential organ damage, is one such adverse outcome, along with preterm birth, fetal growth restriction, and stillbirth. While these complications pose immediate risks during pregnancy, they are also linked to a higher lifelong risk of cardiovascular dis-

ease, stroke, and vascular dementia for women. This connection underscores how pregnancy complications may either cause or reflect underlying vulnerabilities rather than being solely isolated events. As such, pregnancy provides a unique window into a woman's future health, offering valuable insights to enhance maternal and fetal/infant well-being in

Liat Shenhav, PhD





Dr. Liat Shenhav's work on the human microbiome made her realize that to advance maternal and child health, she needed to examine one of its most important drivers, human milk, which is optimal for an infant's growth and development.



both the short and long term.

Hypertensive disorders of pregnancy are the second-leading cause of maternal deaths worldwide. Driven by abnormal placental development and function, they profoundly affect the course of pregnancy, with lasting impacts on maternal health. However, the placenta is currently difficult to assess, and no single diagnostic test reliably detects hypertensive disorders of pregnancy early in their development.

Our lab addresses this gap by using the eye as a proxy for placental and pregnancy health. Through high-resolution, noninvasive retinal imaging and tailored algorithms, we aim to predict hypertensive disorders and other adverse pregnancy outcomes.

Research shows that vascular reactivity increases in women at risk for these disorders, with significant placental changes occurring as early as the first trimester. While previous studies have noted retinal vascular changes postpartum, we are among the first to rigorously assess these changes early in pregnancy, before clinical symptoms appear. Importantly, early identification offers a chance to prevent or treat poor outcomes for both mothers and infants. This is a collaboration with Dr. Sri-laxmi Bearely, a retina specialist at Columbia University Irving Medical Center and Columbia's Department of Obstetrics and Gynecology.

In short, we collect data and develop algorithms to drive discoveries in areas of health that have long been underserved. It's truly amazing to think that I've been able to shape my career around this work, combining my love for math and algorithms with my commitment to advancing women's health in ways I never could have imagined.

## THE PASSIONS THAT DRIVE OUR PIONEERING SCIENTISTS

### Behind the Breakthrough

A New Video Series Introduced by  
**Dafna Bar-Sagi, PhD**  
Chief Scientific Officer



Dr. Liat Shenhav is among the distinguished biomedical researchers at NYU Grossman School of Medicine who are highlighted in *Behind the Breakthrough: NYU Langone Researchers Tell Their Stories*, a new monthly video series. Each episode unveils the personal journeys and transformative discoveries that nurture NYU Langone Health's lifesaving mission. By sharing the unique stories of leading minds in science, this series offers insight into how pivotal life experiences can inspire world-changing research. Watch the new video series at [nyulangone.org/behindthebreakthrough](https://nyulangone.org/behindthebreakthrough).

**“Remarkably, we know more about what’s in a strawberry than what’s in human milk. We aim to understand how the components and dynamics of human milk drive early-life development and shape long-term health outcomes.”**

**LIAT SHENHAV, PHD**



Milestones

# LUNG TRANSPLANT PROGRAM ACHIEVES TWO MEDICAL BREAKTHROUGHS ONE MONTH APART



Dr. Eugene Grossi tends to the patient, Cheryl Mehrkar, as Dr. Stephanie Chang controls the da Vinci Xi robotic system from a nearby console. One of the robot's many virtues is its wristed instruments, which can bend and rotate far beyond the abilities of the human hand and replicate the surgeon's hand movements in real time.



On September 10, 2024, a surgical team from the NYU Langone Transplant Institute performed the first fully robotic lung transplant in the US, a milestone in surgical innovation for lung transplant surgery.

Just one month later, on October 22, NYU Langone Health made medical history again, completing the world's first fully robotic *double* lung transplant. The seven-hour procedure, a breakthrough in both robotic surgery and minimally invasive patient care, positioned the health system, which performs more than 2,000 robot-assisted surgeries each year, as the new global leader in robotic transplant surgery.

A surgical team led by cardiothoracic surgeon Stephanie Chang, MD, surgical director of NYU Langone's Lung Transplant Program, transplanted both lungs of a deceased donor into Cheryl Mehrkar, a 57-year-old woman with chronic obstructive pulmonary disease (COPD), just four days after the patient was placed on the lung transplant wait list. The procedure was performed using the da Vinci Xi robotic system, with small incisions made between the ribs to remove the lungs, prepare the surgical site, and implant the new lungs. The smaller incisions made possible by robotic lung transplant surgery are expected to speed up the patient's healing and shorten hospital stays following the complex procedure. Dr. Chang was assisted by cardiothoracic surgeons Travis Geraci, MD, and Eugene Grossi, MD, the Stephen B. Colvin, MD, Professor of Cardiothoracic Surgery, and supported by Luis Angel, MD, medical director of lung transplantation.

"By using these robotic systems, we aim to reduce the impact this major surgery has on patients, limit their postoperative pain, and give them the best possible outcome," says Dr. Chang. "It couldn't happen without an institution dedicated to moving transplantation forward."

Mehrkar, who inherited a genetic predisposition to lung disease, was diagnosed with COPD in 2010; her condition worsened after a bout with COVID-19 in 2022. Throughout her

life, she has been an avid adventurer, exploring the undersea world as a scuba divemaster, becoming a devoted motorcyclist, and earning a black belt in karate with her husband, Shahin.

Mehrkar was discharged on November 21 and hopes to return to the

## MEET THE EXPERTS



**Stephanie Chang, MD**  
CARDIOTHORACIC SURGERY



**Travis Geraci, MD**  
CARDIOTHORACIC SURGERY



**Eugene Grossi, MD**  
CARDIOTHORACIC SURGERY

Cheryl Mehrkar and her husband, Shahin, taught karate at their dojo until her COPD sidelined her. With two new lungs, she hopes to return to an active lifestyle, including her work as a volunteer emergency medical technician.



activities she loves, including being a volunteer emergency medical technician with a local fire department in Dutchess County, New York.

"I'm so grateful to the donor and their family for giving me another chance at life," says Mehrkar. "For a long time, I was told I wasn't sick enough for a transplant. The team at NYU Langone centered my quality of life as a priority, and I'm so grateful to the doctors and nurses there for giving me hope."

The NYU Langone Transplant Institute performed 76 lung transplants in 2023. It was rated best in the nation for one-year lung survival after transplant (meaning the organ hasn't been rejected or become dysfunctional) and for getting patients off the waitlist the fastest by the Scientific Registry of Transplant Recipients, a national quality track-

er. Both metrics are consistent with NYU Langone's record of maintaining the lowest mortality rates of any academic medical center in the nation, as measured by Vizient, Inc., the nation's leading healthcare performance-improvement organization. "Our Transplant Institute team pushes the field forward to better serve our patients and deliver the lifesaving care they need with the best patient experience," says Robert Montgomery, MD, PhD, the H. Leon Pachter, MD, Professor of Surgery, chair of the Department of Surgery, and director of the NYU Langone Transplant Institute.


"This latest innovation is a watershed moment in lung transplantation surgery worldwide," says Ralph Mosca, MD, the Henry H. Arnhold Chair of Cardiothoracic Surgery and director of the Pediatric Congenital Heart Program at Hassenfeld Children's Hospital at NYU Langone. "It's just the beginning of a new era in patient care."



FOR INFORMATION ABOUT NYU LANGONE'S LUNG TRANSPLANT PROGRAM, VISIT [NYULANGONE.ORG/LUNGTRANSPLANT](https://nyulangone.org/lungtransplant), OR CALL 866-838-5864.



## Pioneering Medicine



Susan Joseph, photographed at Brooklyn Bridge Park in November, says she is embracing life more than ever since having her potentially fatal aneurysms repaired.



# AFTER TWO POTENTIALLY LETHAL BRAIN ANEURYSMS, A BROOKLYN WOMAN FINDS A LASTING FIX

“Dr. Caleb Rutledge is  
my angel. I am so grateful  
for that man.”

SUSAN JOSEPH



**“You don’t meet many people who have had two subarachnoid hemorrhages. It’s like being struck by lightning twice. Susan has been through so much, but she’s so resilient. Her smile lights up the room.”**

**CALEB RUTLEDGE, MD, DIRECTOR OF VASCULAR NEUROSURGERY AT NYU LANGONE HOSPITAL—BROOKLYN**

On the evening of March 9, 2022, Susan Joseph was walking to her car after a meeting in Brooklyn when she was struck by the most intense headache of her life. “It was like a thunderclap,” she says. “I thought my head was about to explode.” The pain was terrifyingly familiar, however: a decade earlier, she’d felt something similar when a ruptured cerebral aneurysm nearly killed her. As she clutched her skull, a coworker asked if he should call for an ambulance. Joseph, a supervisor for an inventory firm, managed to say, “Yes, please,” before blacking out.

The now-53-year-old was rushed to a nearby hospital, where a CT scan showed a subarachnoid hemorrhage—bleeding around the brain. Unable to provide the specialized care Joseph needed, doctors transferred her to NYU Langone Hospital—Brooklyn, a Level 1 stroke center that often accepts patients from neighboring hospitals, and for good reason. NYU Langone Health’s Department of Neurosurgery has ranked #1 in the country on *U.S. News & World Report*’s Best Hospitals Honor Roll for three straight years. Completing more than 6,000 neurosurgical cases each year, NYU Langone has a mortality rate of less than 0.1% for cranial procedures, the nation’s lowest.

A CT angiogram, which produces detailed images of blood vessels, revealed that the source of Joseph’s hemorrhage was another ruptured aneurysm. A cerebral aneurysm is a weak spot on an artery in the brain that balloons out and fills with blood. As many as one in 50 people have a brain aneurysm. If it bursts, it can cause a hemorrhagic stroke, brain damage, coma, or in about 15,000 cases in the US each year, death. “About one-third of patients don’t make it to the hospital,” explains Caleb Rutledge, MD, director of vascular neurosurgery at NYU Langone Hospital—Brooklyn. “About one-third survive after we treat the aneurysm, but they have significant disability. And about one-third go home with a good outcome.”

Joseph’s rupture was a basilar

artery aneurysm, at the base of the brain in front of the brainstem. Fortunately, a temporary clot, or platelet plug, had stopped the bleeding, but the aneurysm could rebleed at any time. Adding to the complexity of Joseph’s case, the scan turned up four additional high-risk aneurysms that would also ultimately require intervention.

“Our first goal was to prevent the ruptured aneurysm from rebleeding,” says Dr. Rutledge, who performed a minimally invasive endovascular procedure known as a coil embolization. He inserted a long, thin, hollow tube, or microcatheter, from an artery in Joseph’s arm and guided it into the sac of the aneurysm in the brain. Then, he delivered a set of tiny metal coils through the catheter, plugging the aneurysm.

A coil embolization, however, can provide only a temporary fix for some types of aneurysms, including Joseph’s, which had a wide neck. So after her recovery, Dr. Rutledge planned a second procedure, using an implant designed not just to temporarily plug the aneurysm but to cure it. Known as the pipeline embolization device (PED), it works by redirecting blood flow past the aneurysm through a flexible tube composed of very thin wires braided into a stent. Over time, endothelial cells that line normal blood vessels overgrow and cover the device, permanently healing the diseased blood vessel. The catch: the PED could not be inserted until the swelling in her brain subsided, and that could take several months. In the meantime, the team could tend to the other aneurysms that needed attention.

Joseph eagerly agreed to the plan. After several weeks in the hospital, she was able to return home. That May, she underwent open brain surgery to have two of her other dangerous aneurysms treated with clips. By August, she was ready for the PED.

Dr. Rutledge had implanted such devices many times since they were first approved by the Food and Drug Administration in 2011. In this case, though, he planned to use a new version—the Vantage PED, just 2.5 millimeters in diameter, delivered with a smaller microcatheter that fits more easily into smaller distal blood vessels. He asked one of his colleagues, neurointerventionalist Peter Kim Nelson, MD, who invented the device, to assist him (see “A Lifesaving Diversion,” page 15).

As with a coil embolization, a PED is inserted via an endovascular procedure. On the morning of August 2, both men scrubbed in together, guided the catheter through a puncture in her arm, and used a hair-thin wire to deliver the device across the neck of the aneurysm.

Joseph was discharged the next day and back at work two days after that. More than two years later, she has fully recovered from the thunderclap that felled her that night, and her aneurysms remain at bay.

“You don’t meet many people who have had two subarachnoid hemorrhages,” says Dr. Rutledge, who continues to see Joseph for regular checkups. “It’s like being struck by lightning twice. Susan has been through so much, but she’s so resilient. Her smile lights up the room.”

Joseph confirms that she has plenty to be thankful for these days. Freed from anxiety over the fragile vessels in her brain, she now takes Caribbean cruises, goes dancing on weekends, and relishes playing with her seven grandchildren. “I’m living my best life now,” she says. “Dr. Rutledge is my angel. I am so grateful for that man.”

## MEET THE EXPERTS



**Caleb Rutledge, MD**  
NEUROSURGERY



**Peter Kim Nelson, MD**  
NEUROINTERVENTIONAL RADIOLOGY



TO LEARN MORE ABOUT NEUROVASCULAR DISEASE, VISIT [NYULANGONE.ORG/NEUROVASCULAR](http://NYULANGONE.ORG/NEUROVASCULAR), OR CALL 646-929-7800.



# A LIFESAVING DIVERSION

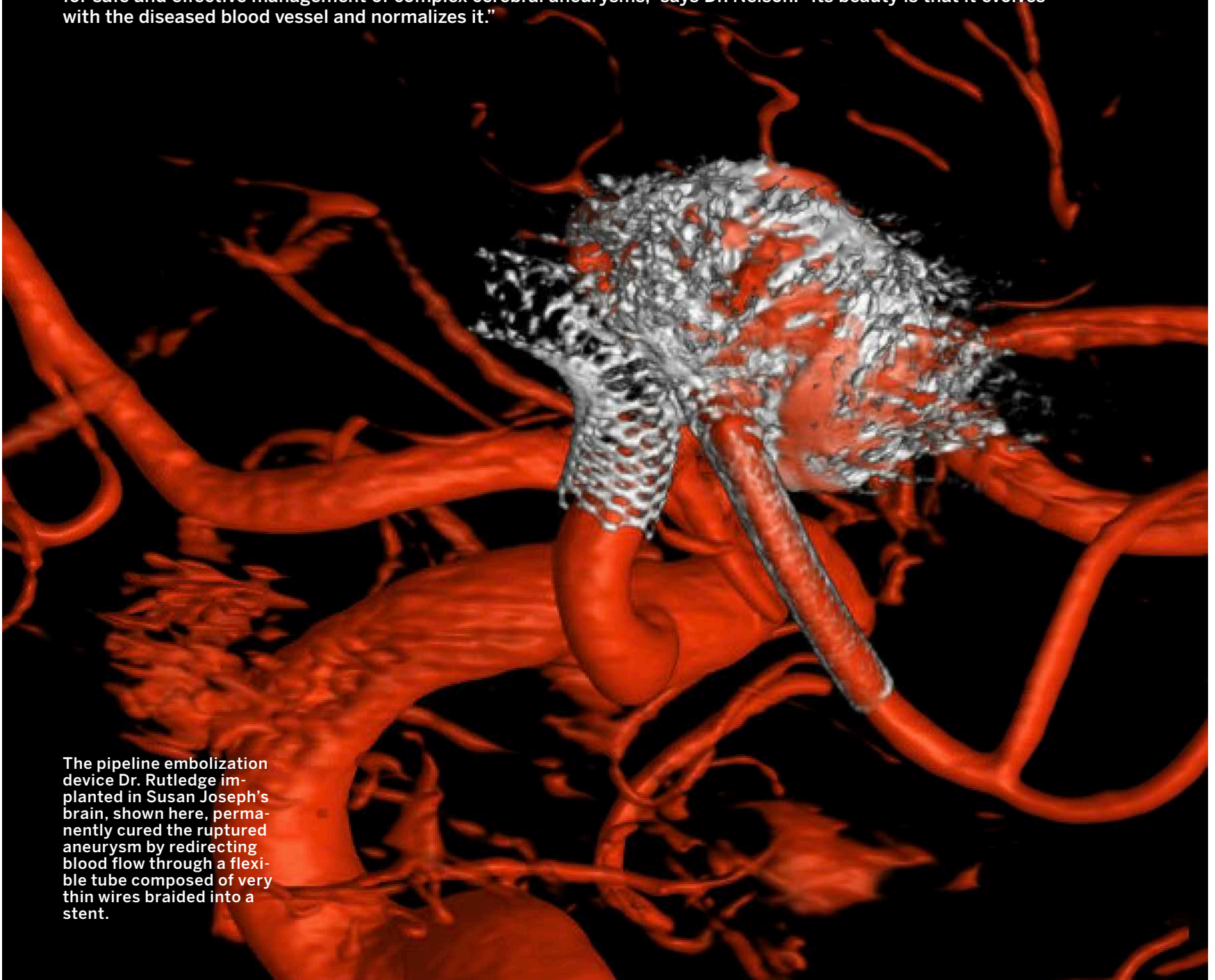
“Dr. Peter Kim Nelson is famous,” noted a distinguished neurosurgeon who once introduced him to a group of trainees, “but you might not know who he is.”

Indeed, while Dr. Nelson heads two neurointerventional services—one at NYU Langone Health and another at NYC Health + Hospitals/Bellevue—his reputation stems as much from his scientific ingenuity as it does from his clinical expertise.

In 2011, he introduced the first commercially available device to divert blood flow away from a brain aneurysm. The pipeline embolization device (PED), a braided cylindrical mesh tube implanted across the base, or neck, of the aneurysm, is a self-expanding mechanism that permanently seals off the opening.

An estimated 500,000 people worldwide die each year from ruptured brain aneurysms, half of them younger than 50. But there’s no estimate for how many lives have been saved by Dr. Nelson’s device, developed and refined with assistance from more than a dozen colleagues at NYU Langone and engineers at Medtronic, Inc.

Large, wide-necked aneurysms are particularly challenging to treat. The few surgical options available carry the risks of damage to other blood vessels, recurrence, rebleeding, and stroke. “The diverter established a new vanguard for safe and effective management of complex cerebral aneurysms,” says Dr. Nelson. “Its beauty is that it evolves with the diseased blood vessel and normalizes it.”



The pipeline embolization device Dr. Rutledge implanted in Susan Joseph’s brain, shown here, permanently cured the ruptured aneurysm by redirecting blood flow through a flexible tube composed of very thin wires braided into a stent.



Educational Reform

# OUR THREE-YEAR MD GRADUATES ARE MORE THAN READY FOR RESIDENCY—AND THE NUMBERS PROVE IT

The 2024 NYU Grossman School of Medicine graduation ceremony at Carnegie Hall. The school was the first in the nation to offer a three-year medical program with a direct pathway to all of its residency programs.





Photograph by **Karsten Moran**



Whether accelerated graduates of NYU Grossman School of Medicine enter a residency program at NYU Langone or at another institution, they perform as well or better than their four-year peers.

In 2013, NYU Grossman School of Medicine decided that when it comes to teaching and training its medical students, less is more. Launching a radical reform to its curriculum, the school began offering select students a pathway to graduate in three years instead of the traditional four. The accelerated three-year MD pathway was designed not only to reduce the burden of educational debt—currently estimated at \$250,000 by graduation—but also to give students a head start on their apprenticeships as residents, training that can extend for up to eight years beyond medical school.

“Our three-year students meet all the same milestones and requirements as four-year students at other schools do,” explains Steven Abramson, MD, the Frederick H. King Professor of Internal Medicine at NYU Grossman School of Medicine, chair of the Department of Medicine, and executive vice president and vice dean for education, faculty, and academic affairs, chief academic officer. “And because these students have identified their specialties early on, they’re able to do residency interviews in their third year.”

The accelerated program was originally limited to select students who had already settled on their intended specialty. Leaders at NYU Grossman School of Medicine have since recognized that *all* students can benefit from this revised approach. As of 2023, every student now graduates in three years or elects to stay for an optional fourth year to pursue research or one of several dual degrees combining an MD with a master’s.

Given the compressed schedule, some residency directors may question whether graduates of a three-year program are as well prepared for the mettle-testing intensity of residency training as their four-year counterparts. However, many years of research, including a new study by NYU Grossman School of Medicine researchers, should help put these concerns to rest (see “*How NYU Grossman School of Medicine Made 3 Greater Than 4*”).



The study, published online October 15 in the journal *Academic Medicine*, evaluated 136 three-year graduates and 681 four-year graduates of NYU Grossman School of Medicine through medical school and early residency. Across virtually all major measures on tests of skill and knowledge, the school’s accelerated graduates performed as well as or better than their four-year peers. For example, the three-year students scored an average of 84% on their preclerkship exams, designed to evaluate their grasp of anatomy, cell biology, biochemistry, and other topics, while their four-year counterparts had a mean score of 83%. The two groups also achieved similar marks on medical knowledge exams and on tests of critical thinking and communication skills.

“Our findings suggest that accelerated curricula offer an efficient, cost-effective way to prepare medical students for the next stage of training, without compromising quality,” says study senior author Joan Cangiarella, MD, the Elaine Langone Professor of Pathology and senior associate dean for education, faculty, and academic affairs, who serves as director of the three-year MD pathway program.

The success of NYU Grossman School of Medicine’s accelerated

program has inspired other medical schools. The school leads a consortium of medical schools, funded by the Josiah Macy Jr. Foundation, that have adopted a three-year curriculum to share best practices. The group, chaired by Dr. Cangiarella, now includes more than 30 medical schools with a three-year program nationwide. In a future study, the researchers plan to expand their investigation to include graduates of other three-year programs.

Mel Rosenfeld, PhD, senior associate dean for medical education, sums up the case for the expansion of programs that enable physicians to begin practicing a year earlier. “How do our three-year students compare to four-year students in residency programs?” he asks. “Extensive data shows virtually no difference. They become chief residents at the same rate, they go on to great fellowships, and they become fine doctors.”

**“Our findings suggest that accelerated curricula offer an efficient, cost-effective way to prepare medical students for the next stage of training, without compromising quality.”**

**JOAN CANGIARELLA, MD, SENIOR  
ASSOCIATE DEAN FOR EDUCATION, FACULTY,  
AND ACADEMIC AFFAIRS**



# NOW IT'S OFFICIAL: NYU GROSSMAN SCHOOL OF MEDICINE MADE 3 GREATER THAN 4

NYU Grossman School of Medicine has been able to trim the educational span by one year without compromising quality by recognizing that its students have different styles of learning, and by developing a curriculum that's tailored to meet their individual needs and preferences.

"We've moved away from the model that says all students require the fourth year of medical school, replacing it with an emphasis on the continuum of learning from undergraduate to graduate medical education," explains study coauthor Steven Abramson, MD, chair of the Department of Medicine and executive vice president and vice dean for education, faculty, and academic affairs, chief academic officer (see "Our Three-Year MD Graduates Are More Than Ready for Residency—and the Numbers Prove It," page 16).

The school's approach to individualized learning, called Precision Education, leverages the power of advanced technologies and artificial intelligence to provide time-saving tools and resources. Analytics take into account each student's unique background, experiences, and aptitude, making possible a fully integrated course of study.

In the clinical realm, algorithms draw upon deidentified patient data to help students hone their diagnostic and decision-making skills. A custom-designed navigator app enables students to shadow faculty members in any medical specialty. Beyond this, students benefit from continuous mentoring by a faculty member within their own chosen specialty.

Marc Triola, MD, associate dean for educational informatics and director of the Institute for Innovations in Medical Education, explains the benefit of this approach. "Precision Education factors in the complex mechanisms underlying each student's goals and needs in a way that can help improve learner outcomes and, by extension, patient outcomes," says Dr. Triola.

# THREE-YEAR MD GRADUATES WEIGH IN ON THEIR EDUCATION

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Prior to my medical training, I had a strong career in research—a PhD from the Scripps Research Institute and postdoctoral training at Memorial Sloan Kettering Cancer Center. At NYU Grossman School of Medicine, I excelled in my clinical training and identified mentors who supported me along the way. So when I applied for residency in my second year, I was a very attractive candidate, not just for residency, but beyond.

Cory Rillahan, MD, PhD, class of 2019, a third-year fellow in pediatric oncology at Boston Children's Hospital/Dana Farber Cancer Institute

I feel just as well prepared as my fellow residents. The transition to residency is challenging, but I don't think another year of medical school would have made a difference. At a certain point, you need to start practicing with some independence, which is what residency is. Most people don't know I graduated in three years, and they're surprised when I tell them.

Taariq Mohammed, MD, class of 2019, a second-year fellow in vitreoretinal surgery at the University of Iowa, and previously chief resident in ophthalmology at the University of Baltimore



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Surgical Innovation



# COMPLEX PROCEDURE DELIVERS KNOCKOUT BLOW TO A SERIOUS HEART DEFECT



HALEY RICCIARDI; RIGHT: COURTESY OF PHIL PASSEN

Left: Phil Passen shows off the scar from the complex aortic surgery performed by Dr. Mark Peterson (far left). Accompanying them are Meghan Taylor, NP, MSN, and Jodi Feinberg, NP, MSN, assistant program director for cardiothoracic surgery. Above right: Passen boxing at his gym in Miami.



Phil Passen had no reason to suspect he was anything less than superbly healthy. At 46, he ran 30 miles a week, boxed recreationally at his local gym, and relished his fast-paced job in finance.

During his annual physical at NYU Langone Health in 2016, however, his primary care physician, Anelise Engel, MD, detected a slight heart murmur. She referred Passen to cardiologist Olivier Frankenberger, MD, PhD, who ordered an ultrasound. The resulting images revealed a congenital heart defect known as a bicuspid aortic valve.

A normal aortic valve has three flaps, or cusps, that open and close with each heartbeat; a bicuspid valve, which occurs in only 1% to 2% of the population, has only two. Over time, valves with only two cusps are more prone to calcify, narrowing the valve and restricting blood flow, a condition called aortic stenosis. “Dr. Frankenberger told my wife, Priscilla, and me that most patients eventually need to have the valve replaced,” Passen recalls. “At that point, though, my stenosis was mild, so he advised that we watch and wait.”

Passen had regular checkups until he moved to Miami in 2019. Soon after, the COVID pandemic hit, making it impossible to schedule an appointment with a new cardiologist. Because he remained free of the telltale symptoms, such as shortness of breath or lightheadedness, Passen then put off seeing a doctor for another three years. When he finally did, in May 2023, he got the news he’d long dreaded: he needed surgery.

Passen was offered two options. He could choose a mechanical valve, which would require him to be on lifelong blood thinners and force him to abandon his athletic pursuits, or a cow valve, which would potentially require replacement every 10 to 15 years, a daunting prospect given his relative youth. “Both



**“My future would have looked very different if I hadn’t had the opportunity to choose the Ross procedure, and if not for the attentiveness, care, and expertise of everyone on my team.”**

**PHIL PASSEN**

alternatives scared me,” Passen says.

Passen quickly flew to New York. After running several tests, Dr. Frankenger confirmed that a new valve was needed, though it could safely wait a few months. Then, he referred Passen to Mark Peterson, MD, PhD, an internationally recognized leader in rebuilding dysfunctional aortas and aortic valves.

Dr. Peterson, who had recently joined NYU Langone Heart as system director of aortic surgery, told Passen about a third option, a complex and demanding surgery known as a Ross procedure. The technique requires placing the patient on a heart-lung bypass machine, replacing the defective aortic valve with the patient’s own pulmonary valve—a kind of self-transplant—and then replacing the pulmonary valve with one from a deceased donor.

The open surgery is more complex than a conventional aortic valve replacement, but with a substantial payoff. “When performed by a skilled surgeon and for the right patient, the Ross procedure offers a unique opportunity to restore health, longevity, and quality of life,” says Dr. Peterson. “It provides decades-long durability while eliminating the need for blood thinners.”

The challenge is finding a qualified surgeon. Few specialists possess the necessary expertise and skill, but Dr. Peterson is a senior member of that elite corps. He has performed many hundreds of reconstructive aortic root procedures, including the Ross procedure, during the past 15 years and does several each week alongside other intricate surgeries, including challenging aortic aneurysm repairs. Dr. Peterson’s track record and NYU Langone’s #2 ranking for cardiology and heart surgery in *U.S. News & World Report’s* Best Hospital rankings persuaded Passen to take the leap.

The four-hour surgery took place on March 26, 2024. It went smoothly, and Passen’s recovery benefited from NYU Langone’s groundbreaking fast-track protocol after cardiac surgery. “Put simply, we get patients up and moving as soon as possible,”



Phil Passen with his daughter, Sofia, and wife, Priscilla, during a summer 2024 trip to the Provence region of France, four months after his complex heart procedure.

says Jodi Feinberg, NP, MSN, assistant program director for cardiothoracic surgery. Studies show such measures lead to fewer postoperative complications, faster recovery, and shorter hospital stays.

Within two hours, Passen was walking laps around the intensive care unit. He was discharged after just three days, well below the average for a Ross procedure. (It’s also consistent with NYU Langone’s system-wide quality control measures, which ensure surgical patients go home earlier here than at 95% of comprehensive academic medical centers, as rated by Vizient, Inc.,

a leading healthcare performance-improvement organization.) Passen flew back to Miami two weeks later. In a little over a month, he was back to running and boxing. Now 54, he’s grateful to Priscilla and his daughter, Sofia, 9, for their support throughout his medical ordeal—and to NYU Langone clinicians for restoring him to robust health.

“Physically, I feel better than ever, and it’s a huge relief to be free of the worry I carried for years that something might happen to my heart,” says Passen, who returns periodically for follow-up visits with Dr. Peterson and Dr. Frankenger. “My future would have looked very different if I hadn’t had the opportunity to choose this procedure, and if not for the attentiveness, care, and expertise of everyone on my team.”

## MEET THE EXPERTS



**Mark Peterson, MD, PhD**  
CARDIOTHORACIC SURGERY



**Olivier Frankenger, MD, PhD**  
CARDIOLOGY



**Anelise Engel, MD**  
INTERNAL MEDICINE

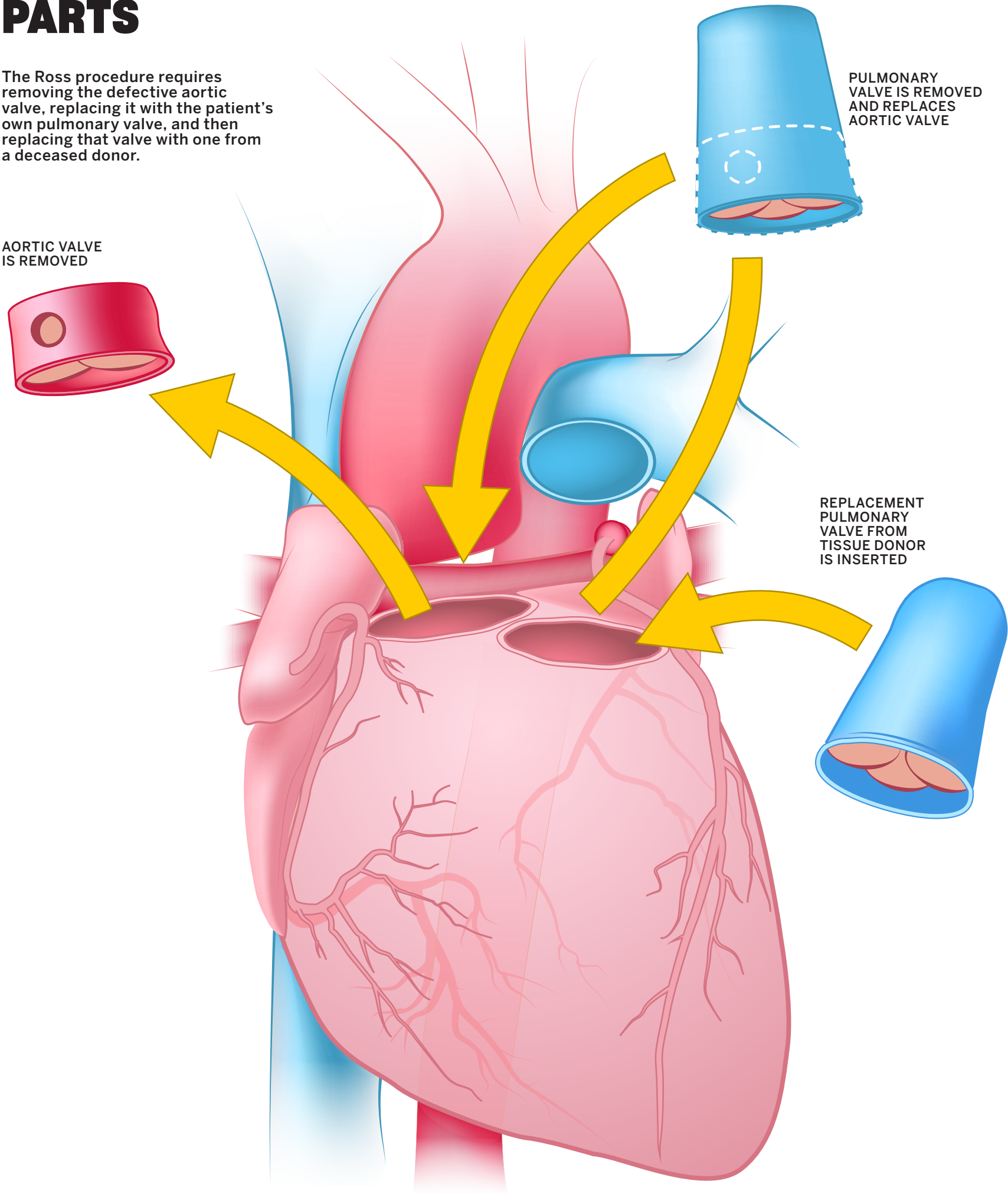


TO FIND A DOCTOR WHO TREATS AORTIC DISEASE, VISIT NYULANGONE.ORG/AORTICCENTER, OR CALL 212-263-5959.



# THIS SURGERY HAS MANY MOVING PARTS

The Ross procedure requires removing the defective aortic valve, replacing it with the patient's own pulmonary valve, and then replacing that valve with one from a deceased donor.





Center of Attention

# A NEW ERA OF PERS

## ■ THE NEED

Cancer researchers have traditionally classified tumors primarily by location: lung, breast, prostate, colon, and so on. But as Shridar Ganesan, MD, PhD, an expert in cancer biology and DNA repair, notes, more recent evidence has shown that sorting based on anatomy is not the most effective approach. "Saying 'lung cancer' is kind of like saying 'pneumonia,' in that it's not specific enough," explains Dr. Ganesan. Just as there are many types of pneumonia, whose treatment approach varies depending upon the specific infection causing it, lung cancer is actually a large collection of diseases. Researchers have come to realize that optimal cancer treatment often depends upon a tumor's unique traits, such as its acquired genetic mutations, rather than its location. The key is to identify the altered genes, proteins, and other molecules that may be driving a tumor's development and progression. "This is a fundamental change in how we classify our diseases, understand their biology, and break them down from organ-based syndromes into specific diseases for which we have specific treatments," says Dr. Ganesan.

## ■ THE DRAW

Since joining NYU Langone Health in October as inaugural director of the Center for Molecular Oncology at NYU Langone's Laura and Isaac Perlmutter Cancer Center, Dr. Ganesan has been working to put an ambitious new classification system into practice. The institution's depth of expertise in basic biology, genomics, and clinical research, as well as its infrastructure, were primary factors in his decision to join NYU Langone from Rutgers Cancer Institute. In his new role, he leads the push toward providing an unprecedented level of personalized cancer care. Collecting and overlaying information on each patient's unique disease could help answer critical questions, such as What mutations are driving a cancer? When is it likely to return? How is it evolving during treatment? Where are its weak points? The goal is to scale up the new service and ensure that it is available to every patient. "We'll have this expertise at all 11 of our sites across the enterprise, regardless of where patients enter the system," says Alec Kimmelman, MD, PhD, director of Perlmutter Cancer Center.



# ONALIZED CANCER CARE

## ■ THE APPROACH

As part of the new standard of care, the center will provide to every patient serial liquid biopsies, blood tests that allow the DNA of cancer cells to be sequenced at different time points. "Right now, comprehensive molecular characterization of tumors tends to be used to help guide treatments only after everything else has failed," Dr. Ganesan says. With the new system's phase-in slated to begin this year, each cancer's molecular profile will be part of the up-front diagnosis and classification. By integrating that profile with findings from pathology, histology, radiology, and other medical data, clinicians can drill down into key features, such as a tumor's behavior and its response to therapy. Clarifying the basic biology of each cancer provides an in-depth profile of its traits and weaknesses that can help doctors diagnosis it earlier, monitor for relapse or recurrence, match it to available therapies or clinical trials, and help researchers develop new interventions.

## ■ THE NEWS

With Dr. Ganesan's arrival, NYU Langone is now recruiting a leader to expand the cancer data hub within Perlmutter Cancer Center. "We're going to have a lot of information that needs to be integrated and utilized for diagnostics, other clinical purposes, and research," Dr. Kimmelman says. "That means building up both the computing and the personnel infrastructure." It also means developing in-house molecular tests that are more sensitive and specific. New data points like mutations and mechanisms of drug resistance could inform and inspire further research. Ultimately, the team hopes to develop a rapid response program for patients with a cancer diagnosis. "We envision a patient coming in and, within a day, having their tumor biopsied, having the pathological and molecular diagnosis, and if a target is found, leaving with a medication optimal for their specific disease," Dr. Kimmelman says. "We're really taking this to the next level."

Dr. Shridar Ganesan (left), the inaugural director of the Center for Molecular Oncology, and Dr. Alec Kimmelman (right), director of Perlmutter Cancer Center, plan to provide serial liquid biopsies for every patient diagnosed with cancer. These biopsies will help define each cancer and match it to available therapies.



## The Expert Is In

# PAUL GLIMCHER, PHD, ON A NEUROSCIENCE RENAISSANCE

**The Director of NYU Langone Health's Institute for Translational Neuroscience Discusses the Benefits of Bringing Basic and Translational Researchers Together.**

Paul Glimcher, PhD, is regarded as the founder of neuroeconomics, a field that bridges neuroscience, psychology, and economics to understand how humans make challenging choices. In 2004, he established what is now known as the Institute for the Study of Decision Making at NYU and, since 2010, has served as the Julius Silver Professor of Neural Science at NYU Grossman School of Medicine. Last year, he was named to two additional prestigious posts: chair of the Department of Neuroscience and Physiology and director of the Neuroscience Institute, whose mission is to foster collaboration between nearly 1,000 basic, translational, and clinical neuroscientists. The institute was recently relaunched as the Institute for Translational Neuroscience, signaling a new initiative to connect basic and translational research at NYU Langone. We spoke with Dr. Glimcher about that transformation, its potential significance for the future of medical science and patient care, and how his expertise on the complexities of decision making prepared him for this new role.

**Is there a message behind the rebranding of what is now called the Institute for Translational Neuroscience?**

Absolutely. The name change signifies an intensified commitment to finding better treatments for an array of neuropsychiatric conditions that afflict millions of people around the world—including stroke, Parkinson's disease, Alzheimer's, schizophrenia, depression, addiction, and post-traumatic stress disorder [PTSD]. It also reflects a new strategy for achieving that goal.

**Could you describe that strategy?**

In recent years, scientists have made tremendous progress in understand-

ing the mechanisms behind these conditions. Yet we've made far less headway in finding effective therapies. One important reason is lack of integration. Basic neuroscientists study the fundamental workings of the nervous system, while translational and clinical neuroscientists develop and test novel treatments, respectively. But seldom do they work together. The Institute for Translational Neuroscience will help correct this deficit by building networks between basic, translational, and clinical researchers. Although there are a few institutes with similar names at other academic medical centers, they tend to focus exclusively on translational scientists. Ours is the first to base its approach on breaking down the silos between the basic and the translational and clinical researchers.

**What's your overarching vision for the institute?**

We hope to do for neuroscience what the National Cancer Institute [NCI] has done for cancer research in recent decades. If you visited, say, a university department of cell biology or biochemistry in the 1980s, they might have been studying cancer-related proteins as an academic undertaking, but they weren't thinking about clinical applications. Now, thanks largely to NCI initiatives, basic research departments are interlocked with clinical departments in networks dedicated to improving cancer diagnosis and treatment. As a result, cancer mortality is declining, and the number of cancers we can cure is steadily increasing.

**Why is NYU Langone uniquely equipped to take on this formidable challenge?**

Our institution helped launch the modern field of neuroscience in the 1970s with breakthroughs in motor

control, vestibular function, and later, synapses. Our NIH funding for basic neuroscience alone has grown to \$35 million annually as we've expanded one of the world's premier neuroscience departments. We have spectacular basic science labs in the Department of Neuroscience and Physiology. On the other side, our translational and clinical neuroscience researchers are doing incredible work in neurology, psychiatry, rehabilitation, and anesthesiology. By connecting both sides in a systematic way, we can move more rapidly toward making a real difference in patients' lives.

**How will you unify and motivate such a large, scientifically diverse community to accomplish this ambitious plan?**

Our strategy is to identify four areas each year in which NYU Langone's research shows translational promise, starting with stroke, pain, stress, and epilepsy. We'll assemble a think tank of 50 scientists for each area who will develop collaborative projects. The stroke team, for example, brings together basic researchers who study how brain cells respond to injury, and translational and clinical researchers from neurology and Rusk Rehabilitation who investigate ways to improve postacute care.

We're aggressively recruiting scientists who excel at building bridges between disciplines. We're creating technical cores to provide our think tanks with targeted and improved services in areas like neuroimaging and quantitative analysis. And to spur broader interest, we're hosting a colloquium series where each group, starting with the stroke network, will present its most exciting work. This is an opportunity to build community across our neuroscience ecosystem, show what we're capable of, and inspire people to think about new ways to connect the basic and clinical neurosciences.

**Can you explain what kinds of real-world applications will result from these synergies?**

We aim to develop new drugs, diag-

nostic tests, and other interventions for conditions such as schizophrenia and PTSD, where therapeutic options remain severely limited. We also expect to develop more and better options in areas such as mood disorders and Parkinson's disease, where the existing treatments aren't as effective as they could be or don't work well for all patients.

**How does this initiative relate to your work in neuroeconomics?**

I know firsthand how rewarding it can be to cross academic boundaries. I initially trained as a neurophysiologist, but when I was an assistant professor, I also trained in psychology and economics while investigating the brain circuitry behind human decision making. It was challenging, but that multidisciplinary approach has proved terrifically fruitful.

**Can you share some of your own breakthroughs?**

My lab does both basic and translational research. Using behavioral studies and methods such as single-neuron recording and fMRI imaging—a noninvasive technique that measures brain activity by detecting changes in blood flow—we've found that subcortical structures such as the striatum and the hypothalamus play key roles in decision making, in concert with the dopamine reward system. That circuitry is involved in the choices people make about everything from the stock market to substance use.

Beyond this, we've learned how to tell when the process is likely to go awry. We recently designed a decision-making game that predicts when a patient being treated for addiction is within seven days of a future relapse. In addition, we're developing a test that monitors patients' depression severity using a smartphone app. Once completed, it could alert clinicians to the need to adjust a patient's medication much sooner, potentially averting a crisis. We know enough about the brain now to come up with meaningful solutions, and we're beginning to do just that.







## Ambulatory Care

# NYU LANGONE EXPANDS CLINICAL SERVICES IN FLORIDA'S PALM BEACH COUNTY

Since NYU Langone Health established its first ambulatory care practice in Delray Beach, Florida, in 2017, the institution has steadily expanded its outpatient services to patients who live in and travel to the Sunshine State. The newest addition, the fourth in Palm Beach County, is NYU Langone Medical Associates—West Palm Beach, 1601 Forum Place.

Located in Centurion Tower, the multidisciplinary practice expands the range of providers to this community, offering orthopedic, physical therapy, pain management, and rehabilitation services. The state-of-the-art facility includes seven exam rooms and a fully equipped physical therapy gym.

“Thousands of Palm Beach residents travel to New York City to receive their medical care at NYU Langone, and we know that can often be a significant burden to our

patients,” says Andrew Rubin, senior vice president for clinical affairs and ambulatory care. “This new practice, which joins several others we’ve established in Florida over the years, allows us to bring our clinical excellence directly to them.”

The process of creating a presence in Florida, Rubin explains, is similar to how NYU Langone established a footprint on Long Island. “We look at where our patients live and where our doctors can fill gaps in the delivery of clinical care,” he says. “Then, we find physicians and available office spaces to pair our resources with patient needs.”

The expansion is a testament to NYU Langone’s commitment to the communities of Palm Beach County as the health system readies for the opening of the Julia Koch Family Ambulatory Care Center at 324 Datura Street in West Palm Beach in 2026. The state-of-the-art, eight-sto-

ry, 188,000-square-foot facility with 77,000 square feet of space for clinical programs plus parking, made possible by a \$75 million gift by the Julia Koch Family Foundation, will have space for 50 physicians and serve 150,000 patients annually, allowing NYU Langone to dramatically increase the scope of care it provides in the region.

“By continuing to expand our practices and services, we’re not only enhancing care in Florida, but also creating a medical ‘home away from home’ for our patients who divide their time between New York and Florida,” notes Andrew Brotman, MD, executive vice president and vice dean for clinical affairs and strategy, chief clinical officer, at NYU Langone.



FOR MORE INFORMATION ABOUT NYU LANGONE IN PALM BEACH COUNTY, VISIT [NYULANGONE.ORG/FLORIDA](https://www.nyulangone.org/florida), OR CALL 561-853-9740.



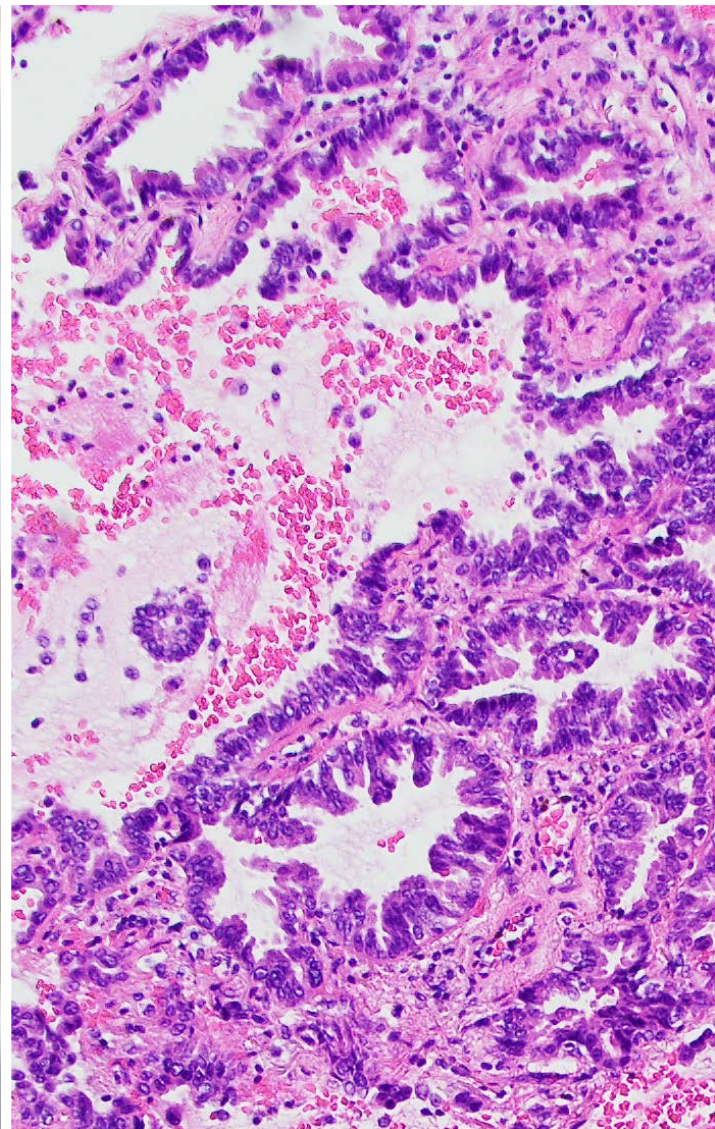
Left: Staff at NYU Langone Medical Associates—West Palm Beach, 1601 Forum Place, a practice that provides orthopedic, physical therapy, pain management, and rehabilitation services. Right: A rendering of the Julia Koch Family Ambulatory Care Center on Datura Street, scheduled to open in 2026.



NYU Langone's expansion in Florida is a testament to its commitment to the communities of Palm Beach County, as the health system readies for the opening of the Julia Koch Family Ambulatory Care Center on Datura Street in West Palm Beach in 2026.







Digitized images of specimens (lower right) provide sharp, high-resolution images equivalent to or better than those produced on glass slides (upper right). State-of-the-art scanners (lower left) can process 60 glass slides per hour, enabling pathologists to review images within minutes rather than hours or days later, as they did when slides had to be transported for viewing under a microscope (upper left).



## Enhancing Patient Care

# AS MICROSCOPES GIVE WAY TO SCANNERS, DIGITAL PATHOLOGY MAKES ITS DEBUT

Patients in need of a definitive diagnosis for a range of diseases typically have two experts on the case: the clinician they visit in the office and the one they never meet. The behind-the-scenes doctor is called a pathologist, and the name—derived from ancient Greek words meaning “the study of suffering”—suggests the gravity of the role. As medical specialists who examine and analyze fluids, tissues, or organs drawn from the patient’s body to identify changes and unusual features, pathologists support every aspect of medical care through their expertise in the microscopic dimensions of disease. Their findings not only guide clinicians throughout the course of the patient’s treatment, but also provide valuable second opinions that validate preliminary diagnoses.

The Department of Pathology at NYU Grossman School of Medicine has played a pioneering role since its inception. In 1881, William Welch, MD, was appointed professor of pathologic anatomy and general pathology, the first full-time appointment of its kind in the US. Together with Edward Janeway, MD, Dr. Welch established the first laboratory for the purpose of studying the cause and pathology of many diseases and for teaching the use of the microscope. Lewis Thomas, MD, who became chair of the department in 1954, shaped its progressive research in the 20th century. Now, the department is taking the lead once again. Leveraging the power of technology and artificial intelligence, it has launched the Digital Pathology Pro-

gram, which promises to transform the method of diagnosing disease.

Since the dawn of the field, pathologists have peered through a microscope at a glass slide containing a thin layer of biopsied tissue embedded in wax, stained with dye, and illuminated, enabling them to discern its features and abnormalities. However, digitized images are now equivalent to or better than those produced on a glass slide, making this transition possible, notes Syed Hoda, MD, director of digital pathology and of bone and soft tissue pathology.

Historically, slides have been delivered to pathologists manually. Now, digitized images can reach these highly specialized experts in real time, equalizing the expertise patients have access to and ensuring the same standard of care across all our campuses. With state-of-the-art scanners, up to 60 glass slides per hour can be digitized at a level of magnification equivalent to 40 times their size, resulting in sharp, high-resolution images on digital screens within minutes. “The previous method of retrieving glass slides from storage and transporting them to a pathologist off-site could delay clinical decisions by hours or even days,” notes Dr. Hoda. “For a patient eager for answers, that wait can feel like an eternity.”

The ongoing enterprise-wide conversion offers a host of additional benefits: unprecedented clarity for viewing samples; no risks associated with the storage of slides or degradation of tissue; enhanced collaboration among clinical colleagues; and

improved workload efficiency for the more than 220,000 cases studied annually by NYU Langone’s 85 clinical pathologists.

“Only a handful of large academic medical centers in the US are using digital pathology, and most have incomplete adoption,” notes Dr. Hoda. “We are one of the first health systems to fully embrace it, with complete systemwide adoption expected by the end of 2025.”

Digitizing pathology images opens fresh possibilities for the art and science of disease detection by laying the groundwork for AI-assisted diagnostics. “This program will diversify our diagnostic toolbox,” explains Sean Hacking, MD, director of digital pathology research. “Digital images will help power the AI models we are building to identify cancer and other diseases at the earliest stage, which can have a huge impact on treatment options.”

Digital pathology’s emergence comes at a crucial time for healthcare. Amid skyrocketing rates of disease, our nation faces a significant shortage of pathologists. “By leveraging the power of AI, NYU Langone is igniting a practice shift that could alleviate a looming healthcare bottleneck,” explains Nader Mherabi, executive vice president and vice dean, chief digital and information officer.

Pathologists will benefit as well, says Joan Cangiarella, MD, the Elaine Langone Professor of Pathology, vice chair of clinical operations in the Department of Pathology at NYU Grossman School of Medicine, and senior associate dean for education, faculty, and academic affairs. “With digital pathology, we can perform this work at a much higher level, allowing us to further elevate the exceptional care we already provide,” she says.

The shift away from microscopes even creates new job opportunities, with NYU Langone in the process of hiring 24 digital pathology coordinators. “This technology will even allow pathologists to work remotely,” adds Dr. Hoda. “It’s not often that we get to reimagine and rethink an entire specialty.”

JOHN ABBOTT (TOP LEFT); PHILIPS DIGITAL PATHOLOGY (BOTTOM LEFT); DR. SYED HODA (TOP RIGHT AND BOTTOM RIGHT)

**“We are one of the first health systems to fully embrace digital pathology, with complete adoption expected by the end of 2025.”**

**SYED HODA, MD, DIRECTOR OF DIGITAL PATHOLOGY AND OF BONE AND SOFT TISSUE PATHOLOGY**



## Translational Medicine

# DR. ELISABETH COHEN'S CRUSADE FOR A BETTER SHINGLES EYE DISEASE TREATMENT LEADS TO A PROMISING THERAPY

Most of the roughly 1 million people each year who get shingles, an infection caused by the same virus that causes chickenpox, endure a painful, blistering rash on the torso or another part of the body that lasts for several weeks. Yet for the roughly 80,000 people, most commonly age 50 and older, for whom the virus affects the nerve that supplies the forehead and eyes, the long-term impact may be severe. The condition, called herpes zoster ophthalmicus, or HZO, can cause infection and inflammation of the cornea or iris, resulting in pain, redness, diminished vision, and sometimes glaucoma. Repeated flare-ups can lead to chronic eye disease, scarring, and vision loss.

Elisabeth Cohen, MD, professor of ophthalmology at NYU Grossman School of Medicine and vice chair of academic affairs in the Department of Ophthalmology, understands the potential impact of HZO all too well. Her own battle with the condition in 2008 damaged her vision and ultimately ended her career as a cornea surgeon. It also launched a 14-year quest to uncover more effective approaches to combat the eye disease, including the recently completed eight-year Zoster Eye Disease Study (ZEDS), funded by a \$15 million grant from the National Eye Institute and cochaired by Bennie Hau Jeng, MD, chair of the Department of Ophthalmology at the University of Pennsylvania.

Dr. Cohen's recent findings could prove transformative. The new research, presented at the American Academy of Ophthalmology's annual meeting in October 2024, found that low-dose daily treatment for one year with the antiviral drug valacyclovir significantly reduces the risk for potentially vision-damaging bouts of inflammation and infection, as well as pain. Those treated were significantly less likely than those who received a placebo to have multiple disease flare-ups, with a 30% reduction in flare-ups at 12 months and a 28% reduction at 18 months.

In addition, participants receiving valacyclovir needed significantly less pain medication for nerve pain that

accompanies shingles. Reducing the use of such medications was a central goal of the work because they have limited effectiveness and often cause dizziness, a dangerous risk factor for patients over age 65, who are most vulnerable to debilitating chronic pain after shingles.

While current standard treatment for HZO is a 7- to 10-day course of an antiviral such as valacyclovir, Dr. Cohen pursued longer-term treatment solutions because many patients continue to suffer pain and have their vision impacted permanently. ZEDS, led by NYU Langone, including principal study investigators Andrea Troxel, ScD, director of the Division of Biostatistics in the Department of Population Health,

and clinical trialist Judith Hochman, MD, senior associate dean for clinical sciences, enrolled 527 participants across 95 medical centers. All were randomized to receive either 1,000 mg of valacyclovir daily or a placebo.

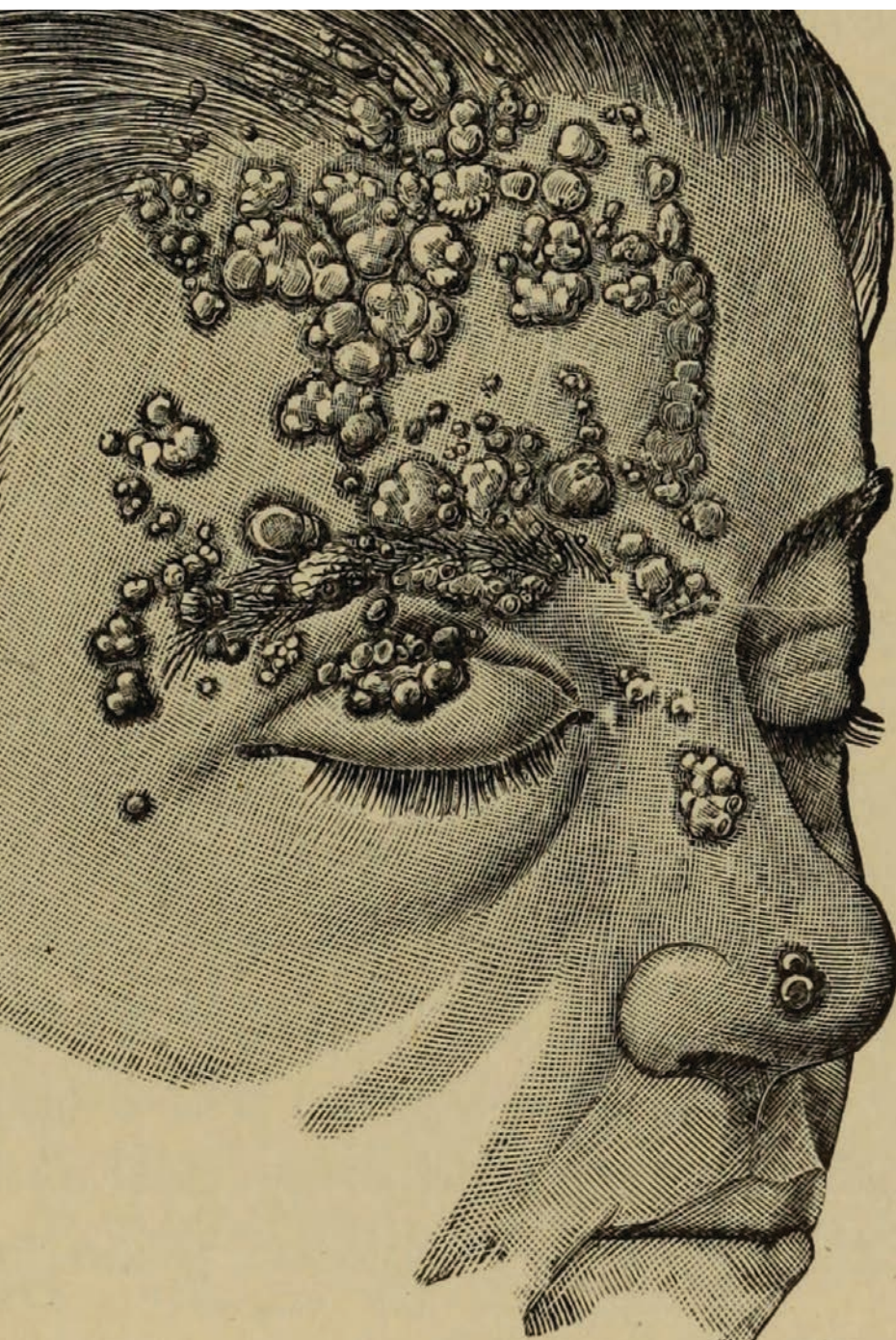
"Our results support changes in clinical practice, with suppressive valacyclovir recommended to reduce new, worsening, and repeated episodes of eye disease, as well as the need for neuropathic pain medication in HZO patients," says Dr. Cohen. "We propose adding to the standard approach a year of low-dose valacyclovir treatment when zoster affects the eye, and further study of the treatment benefit for pain due to zoster in other locations."



Dr. Elisabeth Cohen's eight-year study has revealed a treatment approach that reduces flare-ups of herpes zoster ophthalmicus, a painful form of shingles that can cause severe pain and permanently damage vision.



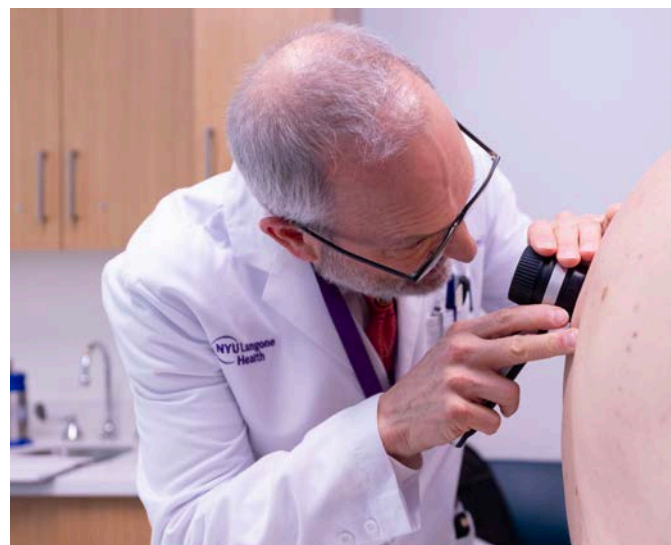
Dermatologist Dr. David Polsky examines a patient for skin cancer (right).



**“We propose adding a year of low-dose valacyclovir treatment when zoster affects the eye, and further study of the treatment benefit for pain due to zoster in other locations.”**

**ELISABETH COHEN, MD, PROFESSOR OF OPHTHALMOLOGY  
AT NYU GROSSMAN SCHOOL OF MEDICINE  
AND VICE CHAIR OF ACADEMIC AFFAIRS IN THE  
DEPARTMENT OF OPHTHALMOLOGY**

## TELEMEDICINE TOOL FOUND HIGHLY ACCURATE IN DIAGNOSING MELANOMA



Taking photos of suspicious-looking skin growths and sending the images to dermatologists for analysis is as accurate for identifying skin cancers as having a dermatologist examine them in person, a new NYU Langone Health study shows.

According to the authors, the findings support evidence that telemedicine is a reliable tool for addressing diagnostic and treatment disparities in lower-income communities, where skin cancer often goes undetected because people may have difficulty finding a local dermatologist or may struggle to take time off from work to attend appointments.

Using a system developed by NYU Langone researchers called SpotCheck, skin cancer specialists can remotely examine skin lesions with the aid of a technique known as dermoscopy, in which a device with a specialized lens enables experts to peer beneath the skin's surface. The tool may aid in the early detection of melanoma, a deadly form of skin cancer that kills more than 8,000 Americans each year.

While previous research has explored telemedicine options for speeding diagnoses of melanoma, this study is among the first to target skin growths first identified by concerned patients rather than by primary care physicians. This is important, because most cases of melanoma are initially spotted by patients or their friends and family.

Led by a team at NYU Langone and its Perlmutter Cancer Center, the new analysis used SpotCheck to evaluate dermoscopic images of 375 skin lesions from volunteers. According to the results, published online November 9 in the *Journal of the American Academy of Dermatology*, experts who remotely reviewed all the samples were 91% accurate in their diagnoses compared with 93% among dermatologists who evaluated volunteers in the Dermatology Clinical Studies unit where the research was conducted.

“Our findings suggest that this method of teledermoscopy may not only help healthcare providers catch potentially dangerous skin cancers early, but may also reduce expensive, anxiety-causing referrals to specialists for benign lesions,” says study senior author David Polsky, MD, PhD, the Alfred W. Kopf, MD, Professor of Dermatologic Oncology and vice chair for research in the Ronald O. Perelman Department of Dermatology. However, Dr. Polsky cautions that the tool is meant to assess specific skin concerns and is not a substitute for a full-body exam by a dermatologist.







"Patients are increasingly relying on emergency departments as the safety net of our health-care system to receive medical care," says Dr. Christopher Caspers, chair of Emergency Medicine at NYU Langone Hospital—Long Island. "It became clear that we needed an expansion to continue to meet the needs of our community."

## Campus Transformation

# ON LONG ISLAND, AN EMERGENCY DEPARTMENT PATIENTS HAVE GROWN UP WITH GETS EVEN BETTER

By any measure, the Emergency Department (ED) at NYU Langone Hospital—Long Island exceeds the expectations of the nearly 85,000 patient visits it accommodates each year, playing a vital role in a health system renowned for its expertise in emergency medicine. On average, patients are seen by a medical provider within 5 minutes of their arrival (down from more than 15 minutes at the start of 2023), and the length of stay for patients who are treated and released has decreased by nearly 15% during the past two years. The Joint Commission, the leading accreditor of healthcare organizations in the US, has praised the Long Island ED for implementing innovative strategies to address overcrowding and space constraints.

Despite these achievements, a concerning trend was emerging. From 2021 to 2023, annual ED visits rose by more than 10% without a corresponding increase in dedicated space. "Patients are increasingly relying on emergency departments as the safety net of our healthcare system to receive medical care," says Christopher Caspers, MD, chair of the Department of Emergency Medicine at NYU Grossman Long Island School of Medicine. "It became clear that we needed an expansion to continue to meet the needs of our community."

NYU Langone Hospital—Long Island has met that need by opening a new ED pavilion. A freestanding annex connected to the existing ED, the 5,200-square-foot facility houses 24 new treatment bays, supplementing the 61 patient bays in the existing ED and increasing overall capacity by about one-third.

"The pavilion is intended to be an

interim measure that will allow us to provide uninterrupted, high-quality care and meet critical patient demand as we work toward planning a more permanent facility in the future," explains Joseph Greco, MD, executive vice president and chief of hospital operations, NYU Langone Hospital—Long Island.

The new pavilion, which serves both adults and children, is intended to care for ED patients who are less acutely ill. Yet its state-of-the-art patient-monitoring technology makes it suitable for treating any medical emergency, should a patient's condition unexpectedly worsen.

"Space is important in the ED because it affords privacy for our patients," says Dr. Caspers. "Space makes it possible to have sensitive conversations, build trust, get to know the patient beyond their clinical need, and understand the circumstances that led to their visit, as well as those they'll face when they leave." A grateful patient expressed their appreciation for that nurturing atmosphere in a thank-you note to the ED team: "From the very beginning of my visit until the end, the doctor made me feel like I was in a private physician's office instead of an emergency room filled with other people."

Amid the frenetic pace and uncertainty of an emergency environment, there's a relentless need to innovate. The ED's team—including 65 physicians, 157 nurses, 25 nurse practitioners and physician assistants, 62 nursing assistants, and 36 staff—has risen to the challenge. Despite space limitations, patient satisfaction scores are the highest they have ever been, and they continue to rise. In the winter of 2023, clinicians

implemented a practice of triaging and evaluating patients from the moment they entered the ED. "We don't wait for a bed to become available before we engage patients," says Dr. Caspers. "Instead, we walk out to our waiting area and bring care to the patients where they are."

A large share of the ED's success, Dr. Caspers notes, is attributable to the collaboration and leadership of its nursing staff. "Emergency care is a team-based effort, and our patient care is defined by the partnership between our nurses and providers, who work side by side," he says.

Heidi Pierluissi, MSOL, BSN, senior director of nursing for the ED, says nurses play a critical role throughout all stages of patient care. "As the first clinical staff members patients often encounter," she says, "they play an integral role, ensuring that patients' needs are met while supporting a positive experience."

A hospital's emergency department might be the last place you'd expect to find neighborliness, but Dr. Caspers sees it as a natural setting for members of the community emergently in need of comfort and care. "I'm a native Long Islander, and NYU Langone Hospital—Long Island is an important part of my community," he says. "Our hospital is a community within our community, and that familiarity, reliability, and trust keep us patient centered. There's nothing like knowing that the hospital you grew up with is the same hospital—and even better—as we continue to grow."







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