

NEWS & VIEWS

The Newsletter of
NYU Langone Health
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MILESTONES

NYU Langone Health Begins New Chapter in Cardiac Care

Expanding its lifesaving repertoire, the Transplant Institute offers hope to patients in need of a new heart.

A decade ago, when Sofya Tokarev, 62, received treatment for an advanced form of cancer, she never imagined the cure would come at a cost so high. By the time she found her way to NYU Langone Levit Medical in Brooklyn, in 2016, she had developed advanced heart failure, a potential complication of some aggressive chemotherapies. Last December, she was so weak she

could barely manage a couple of steps. "I had broached the topic of a heart transplant before," says heart failure specialist Alex Reyentovich, MD, "but now Sofya let go of her reluctance."

Dr. Reyentovich is the medical director of NYU Langone's new Heart Transplant Program, which closely collaborates with six NYU Langone ambulatory practices, includ-

ing Levit Medical, to assess and manage heart-failure patients within their communities. As long as immunosuppressants succeed in preventing organ rejection, Dr. Reyentovich had explained to Tokarev, a transplant could extend life for 13 years or longer, and provide a high quality of life, too, with no physical limitations.

On Friday January 5, Tokarev was matched with a

potential donor in Massachusetts, and transplant surgeon Kazuhiro Hisamoto, MD, was sent to procure the organ. By 9:00 pm that evening, Nader Moazami, MD, NYU Langone's new surgical director of heart transplantation and mechanical circulatory support—assisted by fellow transplant surgeon Deane Smith, MD—had

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PHOTO: TONY LUONG



One month after transplant surgery, Dr. Alex Reyentovich (left) and Dr. Nader Moazami visit their patient, Sofya Tokarev, during a followup.

RESEARCH

Lupus Hits Some Harder Than Others

NYU Langone Health researchers are leading efforts to help identify and treat those who are most susceptible to this debilitating autoimmune disease.

FOR YEARS, SABINA Batista had symptoms doctors could not explain: periodic swelling in her left leg, lower back pain, and a strange tingling sensation in her fingers and toes. The 28-year-old social services case manager from Yonkers, New York, recalls that physicians routinely dismissed or misdiagnosed her health complaints until 2016, when she was finally diagnosed with lupus. The incurable and potentially life-threatening autoimmune disease triggers bouts of inflammation and attacks the body's tissues and organs. In Batista's case, it had begun to assail her kidneys.

Rheumatologists at NYU Langone Health have found that lupus is not only more prevalent among women of color, but also much more aggressive.

For mysterious reasons, lupus hits some people harder than others. Of the estimated 1.5 million Americans afflicted by the disease, most are women of childbearing age. Studies have shown that black women are about three times more likely to suffer from lupus than

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A New Level of Cardiac Care

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given Sofya Tokarev a new heart, and a new lease on life.

The operation, the first of three heart transplants NYU Langone performed in January, came less than one month after New York State's Department of Health granted approval for heart transplantation, and the 50th anniversary of the first human heart transplant. (In January, NYU Langone also received approval to perform lung transplants, appointing Zachary Kon, MD, formerly director of heart and lung transplantation at the University of Maryland Medical Center, as surgical director of its new Lung Transplant Program.)

"Transferring a patient to another institution for a transplant disrupts the continuity of care," says Aubrey Galloway, MD, the Seymour Cohn Professor of Cardiothoracic Surgery and chair of the

Department of Cardiothoracic Surgery. "We no longer need to do that."

NYU Langone's heart transplant program—a collaboration between its Transplant Institute, Department of Cardiothoracic Surgery, and Leon H. Charney Division of Cardiology—is the first such program approved in New York City in more than 15 years. To spearhead it, NYU Langone recruited Dr. Moazami from the Cleveland Clinic, where he led its heart transplant program, earning international recognition as a clinician and researcher (see page 11). "What makes this program special is that it's very comprehensive and multidisciplinary, yet very patient centered," explains Dr. Moazami, who has performed more than 300 heart transplants. "This is a life-changing proposition for patients, and the environment

we've created for them is a very caring one."

The demand for heart transplants has never been higher. More people are surviving heart attacks, placing them at higher risk for heart failure. An estimated 6.5 million Americans live with heart failure. Such patients at NYU Langone who are candidates for a heart transplant or a ventricular assist device (an implanted mechanical circulatory support pump) are evaluated by a team of cardiologists and other specialists led by Dr. Reyentovich. "As an institution with a premier Transplant Institute and several hospitals in the New York area, we can now provide the full spectrum of state-of-the-art care for a large population of patients with advanced heart disease," says Robert Montgomery, MD, DPhil, director of the Transplant Institute.

The demand for heart transplants has never been higher. An estimated 6.5 million Americans live with heart failure. By 2030, that number is projected to rise by some 50%.

For NYU Langone, a successful transplantation program must not only deliver the highest quality of care, but also squarely address the critical shortage of donor organs, a crisis that is particularly acute in New York State. Only 28% of the state's residents are registered organ donors—the lowest rate in the country. While 161 heart transplants were performed in 2016 at the five existing transplant centers throughout the state, some 1,000 people died waiting for a donor heart to become available.

To earn state approval, NYU Langone developed a comprehensive strategy for increasing donation and transplantation rates. Among

its priorities is research to rehabilitate the hundreds of potential donor hearts rejected annually in the US due to diseases such as hepatitis C. "You can always find a reason to reject a marginal heart," says Dr. Moazami. "But the key is to accept as many hearts as possible because this is a truly lifesaving procedure. You win the confidence of patients by demonstrating that you're the best. We have everything in place to ensure that we are." ■

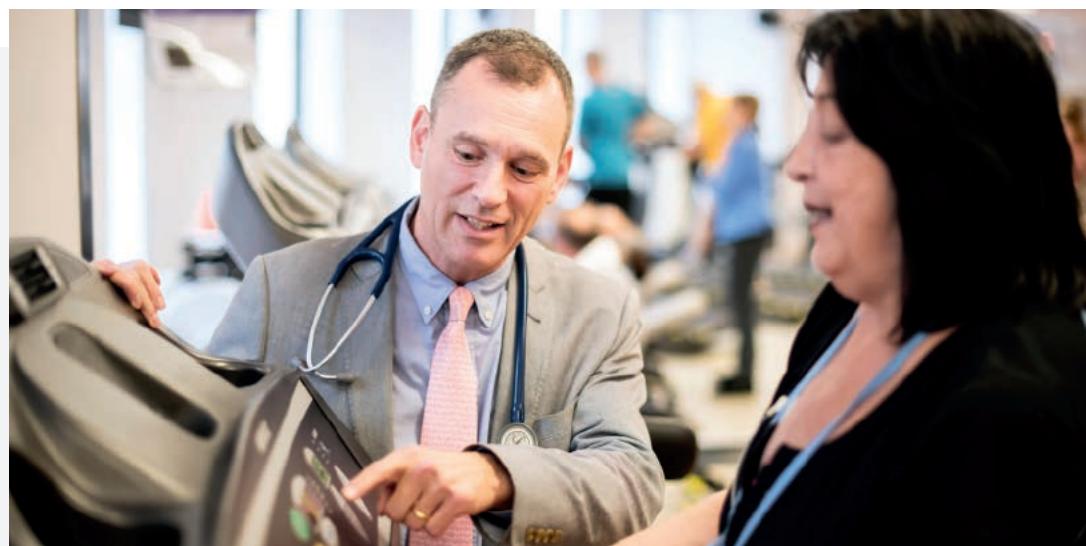
FOR MORE INFORMATION about NYU Langone's Heart Transplant Program, call 833-344-3278 or visit nyulangone.org/transplantinstitute.

GETTING FIT FOR A HEART TRANSPLANT

At Rusk Rehabilitation, "prehab" plays an integral role in preparing heart-transplant patients for the stress of surgery.

FOR MANY OF the estimated 3,000 patients who undergo a heart transplant every year, rehabilitation begins even before surgery. In many cases, by the time someone needs a new heart, years of cardiovascular disease have left the patient increasingly weak and debilitated, compromising their ability to tolerate the demands of transplant surgery and endure the rigors of recovery. As part of their evaluation, transplant candidates at NYU Langone Health are referred to Rusk Rehabilitation's Joan and Joel Smilow Cardiopulmonary Rehabilitation and Prevention Center. The center's evaluation program tests the patient's physical, metabolic, and emotional fitness and guides them through a course of "prehab" exercise and lifestyle modifications to bolster their strength and stamina. "The healthier the patient is going into surgery, the better they'll fare during the operation, throughout the hospital stay, and over the course of their recovery," says Jonathan Whiteson, MD, the center's medical director.

After surgery, patients generally receive two to three weeks of inpatient rehabilitation, followed by three months of outpatient therapy. In the hospital,



physical and occupational therapists treat patients daily to keep them mobile and promote their independence. The outpatient program is designed to increase endurance, reduce symptoms of shortness of breath and fatigue, improve cholesterol and blood sugar levels, facilitate weight loss, provide stress management, and instill a lifelong heart-healthy lifestyle.

Since its inception in 1991, Rusk's center, the largest and most comprehensive program of its kind in the tri-state region, has been at the forefront of managing cardiopulmonary disease. In addition to caring for NYU Langone's patients who have undergone heart transplants and other cardiopulmonary procedures, the program serves patients referred by other local medical centers.

▲ Dr. Jonathan Whiteson (above), the center's medical director, also oversees rehabilitation for patients with cardiac or pulmonary issues who do not need a transplant.

"Many candidates for a heart transplant have become relatively inactive," Dr. Whiteson explains. "They need to improve their strength, endurance, balance, and mobility. It's hard, hard work, and we set high goals to ensure that they thrive. Typically, they are so grateful for a new lease on life that they're highly motivated. For our part, we have a lifelong commitment to these patients. They may mature past their need for us, but we never get over them." ■

At NYU Langone's Lupus Clinic in Manhattan, Dr. Jill Buyon examines her patient Sabina Batista during a follow-up visit.

Tracking Lupus

(Continued from page 1)

white women. Now, research published recently by rheumatologists at NYU Langone Health suggests that lupus also takes a heavy toll on Asian and Hispanic women. "They're two of the fastest-growing populations, but data regarding their risk for lupus has been limited," says rheumatologist Peter Izmirly, MD, the study's lead author.

The epidemiological sleuthing by Dr. Izmirly's research group, called the Manhattan Lupus Surveillance Program, and a related effort called the California Lupus Surveillance Project, documented similar racial and ethnic disparities among men, although at much lower rates. The reasons for these differences are unknown, though data suggest that both genetic and environmental factors play a role.

After her diagnosis, Batista, who is of Dominican heritage, tried to learn all she could about the disease. Her desire for a second opinion led her to NYU Langone, where specialists have long treated a racially and ethnically diverse mix of patients from the New York metropolitan area. That experience is critical, given that Dr. Izmirly's latest findings suggest the disease is not only more prevalent among women of color, but also much more aggressive. "About half the patients with lupus who are black, Asian, or Hispanic are, based on our data, likely to develop lupus kidney disease, compared to only about a quarter of those in the white population," says Dr. Izmirly.

Lupus is devilishly difficult to diagnose. Symptoms can be vague, and there's no definitive diagnostic test. The disease is often associated with a butterfly-shaped rash that covers the bridge of the nose and both cheeks, but not all patients develop this telltale sign. Batista, for example, didn't develop the rash until after multiple tests and referrals finally led to a diagnosis. Dr. Izmirly says healthcare providers should be on the lookout when assessing a range of signs and symptoms—including rashes, joint pain, and signs of kidney disease, such as abnormal urinalysis results, swelling in the legs, and unexplained high blood pressure. "By the time we see some of these patients, they've already had irreversible damage," he says. "So the earlier the diagnosis, the more likely we are to get on top of it and hopefully improve outcomes."

Under NYU Langone's care, Batista found that her disease was far more manageable with the right interventions. An initial daily dose of nine medications had left her depressed, in pain, and unable to sleep. Her new rheumatologists, Dr. Izmirly and Jill Buyon, MD, codirectors of the Lupus Center at NYU Langone, cut that drug regimen by more than half. Along with medication to suppress her lupus-associated kidney disease, Batista now takes an antimalarial drug to suppress flare-ups and an anticoagulant to prevent blood clots, a risk for some patients. Dr. Buyon, the Lady Va-



Under NYU Langone's care, Sabina Batista found that her disease was far more manageable with the right interventions.

and Sir Deryck Maughan Professor of Rheumatology, also encouraged Batista to adopt a healthier diet and lifestyle to help manage her symptoms. "I feel a lot better," Batista says. "I haven't had a flare-up in months."

At the scientific level, Dr. Buyon, Dr. Izmirly, and their research collaborators are exploring potential genetic and environmental links to explain why some groups are more likely to develop lupus and fare worse than others. "The outcome over time is probably some combination of socioeconomic and behavioral, in addition to racial and ethnic, factors," says Dr. Izmirly.

More answers may come from NYU Langone's Translational Center of Molecular Profiling in Preclinical and Established Lupus, or COMPEL. A new five-year, \$6.7 million grant from the National Institutes of Health will aid the researchers' efforts to better characterize lupus in a racially and ethnically diverse group of patients. "It's about looking at women who are at high risk and understanding why they do or don't develop the disease," Dr. Buyon says, "and then looking at people with established lupus and understanding what makes the disease flare." ■

Lupus and the Hidden Burden of Kidney Disease

In one of the most extensive surveillance studies of lupus among minority populations in the US, NYU Langone researchers found that lupus-associated kidney disease was roughly twice as common in nonwhite patients as in their white counterparts.

53% **Asian**

51% **Black**

49% **Hispanic**

25% **White**

TO FIND A DOCTOR who treats lupus, call 646-501-7400 or visit nyulangone.org/lupuscenter



NEW THERAPIES

A Death Sentence Reversed

Clinical trials at NYU Langone pave the way for the first effective therapies for bladder cancer approved in 30 years, giving hope to older patients too frail for conventional treatments.

SEVERAL YEARS AGO, when Arjun Balar, MD, would deliver a diagnosis of advanced bladder cancer to a typical patient—a man over the age of 70—the conversation was a grim one for doctor and patient alike. Dr. Balar, a medical oncologist at NYU Langone Health’s Laura and Isaac Perlmutter Cancer Center, had to explain that if the cancer had traveled beyond the lining of the bladder, that organ and others nearby would need to be removed; that for cancer that had spread beyond the bladder, most older patients found the standard chemotherapy regimen intolerable; and that the less potent alternative would extend life by only 10 months or so. “The patient would be devastated,” recalls Dr. Balar.

But earlier this year, despair gave way to hope. Two ongoing international clinical trials led by Dr. Balar, director of the Genitourinary Medical Oncology Program at the Perlmutter Cancer Center, and funded by pharmaceutical manufacturers, have paved the way for the approval of two novel treatments for patients with advanced bladder cancer who are ineligible for the standard chemotherapy. The medications—the

first ever approved for this typically frail population—give older patients a nearly 25% chance of survival.

Atezolizumab (Tecentriq), approved in April 2017, and pembrolizumab (Keytruda), green-lighted one month later, belong to a class of cancer drugs known as immune checkpoint inhibitors, which are designed to release a break on immune cells, allowing them to attack tumor cells. Trial results showed that the immunotherapy treatments shrank tumors by at least 30% in one-quarter of the nearly 500 study participants combined in both studies. Of those, 5% got the best news imaginable: their tumors had totally disappeared. “While this percentage may seem small,” Dr. Balar notes, “remember that on average, these patients would otherwise have died within 10 months.”

Each year, about 79,000 Americans are diagnosed with bladder cancer. The disease claims some 17,000 lives annually, and less than 15% of those with a late-stage tumor survive more than five years. Bladder cancer strikes four times as many men as women, making it the fourth most common cancer among men. About 80% of those diagnosed are current or former smokers. The malignancy is usually confined to the inner lining of the bladder, requiring most patients to undergo surgery to remove the tumor. If the cancer has invaded deeper, from the inner lining into the muscle, however, the bladder must be removed, along with the prostate in men or the uterus and ovaries in women.

“Removal of the entire bladder and reconstruction of a new urinary tract is a complex surgical procedure associated with a high rate of complications,” explains

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Clinical trials led by Dr. Arjun Balar (left), a medical oncologist who specializes in bladder cancer, have paved the way for the first effective therapies approved in 30 years.

urologic oncology surgeon William Huang, MD, who was not involved in the trials. Dr. Balar, in collaboration with Dr. Huang, is now leading a trial to see if surgery can be avoided by using immunotherapy in combination with chemoradiation. “If immunotherapy can reduce the number of people who may need to have their entire bladder removed,” says Dr. Huang, “that would be a huge step forward.”

Dr. Balar first recognized the potential of immunotherapy during the clinical trial with atezolizumab. He recalls one participant, an 80-year-old woman with a very aggressive cancer that had widely metastasized, who looked and felt better within weeks of her first dose. Dr. Balar reports that three years later, the woman remains cancer free.

Nearly a dozen clinical trials are currently underway at NYU Langone to test novel therapies for bladder cancer, including new immunotherapies, targeted therapies, and combinations. “Patients used to choose between chemotherapy and hospice care,” says Dr. Balar. “It’s a privilege to provide them with hope instead.” ■

TO FIND A DOCTOR who treats bladder cancer, call 646-929-7950 or visit nyulangone.org/cancer

FOOD FOR THOUGHT

5.4

The number of additional cups of fruits and vegetables purchased by food shoppers from Bronx mobile produce vendors who used wireless bank transfers for food stamps.

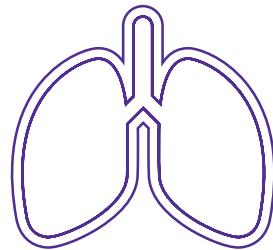
NYU Langone researcher Brian Elbel, PhD, surveyed shoppers to explore ways of improving access to nutritious foods in low-income communities. He hopes the findings might lead policy makers to consider whether more vendors should be equipped for electronic payment. ■



5 Things You Should Know about Lung Cancer

Experts from NYU Langone Health's new Lung Cancer Center share promising news about one of the deadliest forms of cancer.

In the war on cancer, some foes are mightier than others, and lung cancer tops the list. To advance the quest for better treatments and help patients benefit from the latest discoveries, NYU Langone Health recently launched the Lung Cancer Center at the Laura and Isaac Perlmutter Cancer Center. Led by Robert Cerfolio, MD, director of clinical thoracic surgery, the new center brings together a growing roster of internationally recognized researchers and clinicians, who are working to unlock lung cancer's secrets and translate those findings into cutting-edge care. Here, they share some insights.



1 No cancer is deadlier, but the tide may be turning.

Although the numbers are falling as smoking becomes less popular, lung cancer still claims the lives of 158,000 Americans annually—more than breast, colon, and prostate cancers combined. Moreover, the five-year survival rate is less than 20%. Yet new types of treatments are extending life significantly for some patients, and researchers are making strides in understanding the genetic and molecular mechanisms behind the disease. “We’ve reached the end of the beginning,” says Benjamin Neel, MD, PhD, director of the Perlmutter Cancer Center.

“By investing in top talent and dramatically expanding our research capacities, NYU Langone is taking a stand against this major killer.”

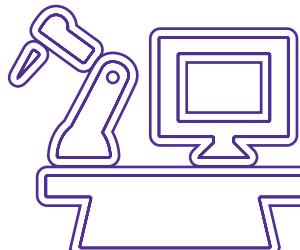


2 Clinical trials can change the odds.

What makes lung cancer so lethal is that it seldom causes symptoms in its earliest stages and tends to spread quickly—primarily to the brain, bones, or liver. Only 16% of cases are diagnosed at stage 1, when they can often be treated surgically. For advanced lung cancers, chemotherapy can be helpful, but newer medications that

target specific genetic changes within the tumor or boost the immune system’s ability to detect and destroy tumor cells can lead to longer and better life. Researchers are still trying to identify which kinds of patients are most likely to benefit.

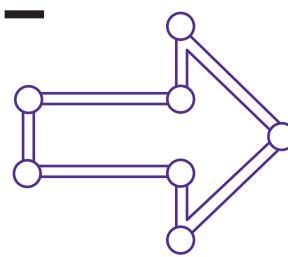
Meanwhile, many clinical trials are devoted to even newer therapies—and new combinations—that may extend the benefit of immunotherapy, in particular, to more patients. “By enrolling in clinical trials for investigational therapies, patients have access to treatments beyond those in our existing arsenal,” explains Leena Gandhi, MD, PhD, director of thoracic medical oncology, who’s currently leading more than 20 trials and collaborating on many others. “For some, that can make a big difference in quality and quantity of life.” Dr. Gandhi is also leading efforts with Kwok-Kin Wong, MD, PhD, director of the Division of Hematology and Medical Oncology, to build a comprehensive database of patient characteristics and specimens to study potential biomarkers of response to different therapies.



3 New high-tech procedures are gentler, with fewer complications.

About 70% of lung cancers are diagnosed among people 65 or older. Invasive procedures, such as open-chest surgeries or needle biopsies, can be especially hard on older

individuals. But interventional pulmonologists now use advanced technology to less invasively perform biopsies that once would have required piercing the chest wall. “These techniques are far less traumatic,” says Gaetane Michaud, MD, chief of interventional pulmonology. “Patients can usually go home the same day.” When surgery is required to remove a tumor, the most common approach is video-assisted thoracic surgery, performed through tiny incisions and guided by a miniature camera. Dr. Cerfolio takes it to another level, relying instead on robotic surgery, which enhances the surgeon’s dexterity and precision. To date, he has performed over 1,750 robotic procedures, more than any other thoracic surgeon in the world. “We can do complex procedures with less pain, faster recovery, and less risk of complications,” he says.



4 Better therapies are quickly emerging.

The pace of cancer research is now advancing at a rapid clip, in part thanks to a remarkable new gene-editing technology that allows scientists to recreate and manipulate cancer genes with unprecedented speed and precision. In the lab, scientists are untangling the factors that accelerate or halt tumor growth and learning to identify molecular signals that reveal which tumors might respond best to which treatments. In the clinic, they’re testing new experimental therapies, including vaccines that stimulate immune cells

and so-called epigenetic drugs that target the proteins that turn genes on or off. “With some forms of leukemia and prostate cancer, patients now live for decades with few symptoms,” says Dr. Kwok-Kin Wong. “It’s going to take time, but we’re on our way to transforming lung cancer into a chronic but controllable disease.”



5 Teamwork counts.

Lung cancer patients often require several specialists, and at NYU Langone’s Lung Cancer Center, the entire team is housed on a single floor, eliminating the stress of traveling to different locations. “If a patient needs a pulmonary drainage procedure, we can perform it on-site,” says Daniel Sterman, MD, the Thomas and Suzanne Murphy Professor of Pulmonary and Critical Care Medicine and director of the Division of Pulmonary, Critical Care, and Sleep Medicine. A team of multidisciplinary experts also convenes at a weekly “tumor board,” where physicians, surgeons, researchers, and nurses discuss challenging cases and the latest science. “We take a coordinated approach to each patient’s care,” explains Abraham Chachoua, MD, the Jay and Isabel Fine Professor of Oncology and associate director of cancer services. “Every person we treat has a think tank on his side.” ▀

Meet the Experts

The new Lung Cancer Center team:

Robert Cerfolio, MD, has performed over 1,600 robotic procedures, more than any other thoracic surgeon.

Leena Gandhi, MD, PhD, designs studies to determine how treatments for lung cancer can be personalized.

Gaetane Michaud, MD, a leading interventional pulmonologist, uses endoscopic tools and techniques to help patients breathe easier.

Kwok-Kin Wong, MD, PhD, is a world-renowned investigator of the genetic and environmental causes of lung cancer.

Daniel Sterman, MD, is internationally recognized for his research on cancer immunotherapy.

TO FIND A DOCTOR who treats lung cancer, call 212-731-5662 or visit nyulangone.org/lungcancercenter.



BEST OF BROOKLYN

Calming the Brain's Electrical Storms

A dedicated epilepsy unit opens at NYU Langone Hospital-Brooklyn, bringing NYU Langone Health's international expertise to a community in need.

EACH YEAR, NEARLY 600 people are brought to the Emergency Department at NYU Langone Hospital-Brooklyn in the throes or aftermath of a seizure. But only two-thirds of these patients are eventually diagnosed with epilepsy, a complex brain disorder characterized by sudden, often unpredictable seizures. “Knowing whether a person is actually having a seizure and diagnosing the type of seizure can be difficult,” notes Nicholas Gavin, MD, chief of service for the Emergency Department. “There are many disorders that can cause changes in behavior and be mistaken for epilepsy. In the Emergency Department, our biggest challenge is when we learn that the patient lost consciousness and exhibited abnormal movements, but has never been diagnosed with epilepsy.”

When the pieces don’t quite fit together, Dr. Gavin explains, it’s time to call in an epileptologist, a neurologist who specializes in epilepsy. NYU Langone Hos-

pital-Brooklyn’s emergency department is now able to tap the expertise of three such experts, who are on call 24/7 to help diagnose and treat the most mysterious or complex cases. They belong to the hospital’s first dedicated epilepsy unit, an eight-bed facility that opened last August.

Epilepsy is a spectrum of disorders that have in common a kind of electrical storm within the brain. The fourth most common neurological disease, it afflicts more than 3 million Americans, and its most severe forms claim the lives of thousands each year. Any person can develop seizures at any age, though the onset is highest among children and the elderly. A seizure typically involves uncontrolled shaking, which can last for a few seconds or several minutes, but in many cases, there are no overt signs.

“Many things can trigger seizures, including fever, alcohol withdrawal, or sleep deprivation,” says Blanca

Vazquez, MD, director of epilepsy clinical trials in NYU Langone Health’s Department of Neurology and head of the epilepsy program at NYU Langone Hospital-Brooklyn. But in more than 60% of cases, the cause is never determined.

The new epilepsy unit is designed to get answers quickly. It’s equipped with state-of-the-art audio-video technology and electroencephalograms (EEGs), which record the electrical activity in the brain. By evaluating the patient’s behavior and EEG results at the same time, clinicians can determine whether epilepsy should be ruled in or out.

“There’s an urgency to make the right diagnosis and prescribe the right medication,” says Dr. Vazquez. “Electrical activity creates a highway for more of the same, resulting in additional seizures. The more seizures patients experience, the more likely they will become treatment resistant.”

In the new Epilepsy Unit of NYU Langone Hospital-Brooklyn, Dr. Blanca Vazquez monitors one of her patients for signs of seizures.

Within the safety of the monitoring unit, doctors may try to provoke a seizure by lowering the dosage of the patient's medication or withdrawing it. "Some people have been treated for seizures for many years, but when we monitor them, we find that 25% don't have epilepsy after all," reports Dr. Vazquez.

When a diagnosis of epilepsy is confirmed, identifying the type of seizure is critical. Partial seizures begin with an abnormal electrical discharge restricted to one small region of the brain, while generalized seizures begin with a widespread, excessive electrical discharge involving both hemispheres. "The medicines used to treat partial seizures actually aggravate generalized ones," Dr. Vazquez explains, "so you really have to know which type you're dealing with."

In severe cases, when medications fail and a surgical intervention may be required, patients can be transferred to NYU Langone's Comprehensive Epilepsy Center at Tisch Hospital in Manhattan (see "Chasing Storms at NYU Langone Health's Comprehensive Epilepsy Center"), where a renowned team of clinicians and researchers treats patients from around the world with complex conditions. "We're fully integrated with the Comprehensive Epilepsy Center at the main campus," notes Jennifer Frontera, MD, chief of neurology at NYU Langone Hospital-Brooklyn, "and being affiliated with such a

"There's an urgency to make the right diagnosis and prescribe the right medication," says Dr. Blanca Vazquez. "Electrical activity creates a highway for more of the same, resulting in additional seizures."

powerhouse program is a huge win for the Brooklyn community."

For the great majority of patients who can be treated at NYU Langone Hospital-Brooklyn, Dr. Vazquez notes that being able to access such specialized care close to home is not only more convenient, but safer. Some patients with epilepsy are not allowed to drive, and public transportation can be risky for someone who can suddenly have a seizure at any moment. "Having a resource like this where patients can be near their families and we can maintain continuity of care is a huge asset," she says. "Good access translates into better compliance to medication, and that translates into fewer ED visits." ■

TO FIND A DOCTOR who treats epilepsy, call 646-558-0800 or visit nyulangone.org/epilepsycenter.

PIONEERS

Chasing Storms at NYU Langone Health's Comprehensive Epilepsy Center

WHEN PATIENTS WITH epilepsy are told that nothing more can be done to control their seizures, many find their way to NYU Langone Health's Comprehensive Epilepsy Center. One of the largest programs of its kind in the US, the center was founded in 1989 to treat the most challenging cases. "Seizures can impact every aspect of the patient's life," notes Orrin Devinsky, MD, the center's director, "and bring significant stigma and isolation."

The center's philosophy, Dr. Devinsky explains, is to devise a balanced care plan that allows people with epilepsy to lead full, active lives. At weekly conferences, a team of epileptologists, neuropsychologists, neurosurgeons, psychiatrists, and other specialists develops a treatment strategy tailored to

each patient. An evaluation typically begins with an outpatient evaluation, which is often followed by an inpatient stay at the center's 16-bed adolescent/adult or 8-bed pediatric monitoring units in Tisch Hospital. Two additional beds are reserved for newborns. Like its newly established counterpart at NYU Langone Hospital-Brooklyn, the unit is equipped with sophisticated technology that enables clinicians to confirm the diagnosis and map the part of the brain where seizures originate.

When localized seizures resist treatment, the center's neurosurgeons can use surgical techniques they've pioneered to neutralize malfunctioning parts of the brain—without injuring healthy brain tissue or impairing neurological function. About 65% of patients who

undergo surgery are cured of seizures. The center is equally renowned for its research, including drug development for cannabidiol-based therapies (see "A Potent Weapon against a Deadly Form of Epilepsy"), studies on sudden unexplained death in epilepsy, and treatments for neuroinflammation-induced epilepsy. ■

A surgical option for localized seizures

65%

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CLINICAL TRIALS

A POTENT WEAPON AGAINST A DEADLY FORM OF EPILEPSY

ONE OF THE rarest forms of epilepsy, Dravet syndrome, is also one of the most dangerous. Not only do its neural storms lead to developmental and cognitive delays, but 20% of those afflicted have died by age 20. The frequent, intense seizures triggered by the disease are seldom fully controllable, even with multiple medications. However, a recent study led by Orrin Devinsky, MD, director of NYU Langone Health's Comprehensive Epilepsy Center, demonstrates that a standardized, pharmaceutical-grade derivative of the cannabis plant—a chemical compound called cannabidiol—can be a potent weapon against the disorder.

Cannabidiol, which is not addictive and has no psychoactive properties, had shown promise in earlier studies, but this one, published last May in the *New England Journal of Medicine*, was the first to subject the drug to a double-blind, placebo-controlled trial—the most rigorous standard of evidence. Dr. Devinsky's team gave cannabidiol or a placebo, along with standard medications, to 120 children and young adults with Dravet syndrome over 14 weeks. In the cannabidiol group, the median frequency of convulsive seizures per month decreased from 12.4 to 5.9, compared with a decrease from 14.9 to 14.1 with placebo. Moreover, 43% of those who took cannabidiol experienced at least a 50% reduction in the frequency of convulsive seizures, compared to 27% in the placebo group—and 5% (versus none on placebo) became seizure free. Most participants experienced mild to moderate side effects, ranging from fatigue and diarrhea to elevated liver enzymes, but only eight had reactions severe enough to discontinue treatment. Future studies will explore whether the effectiveness of standardized cannabidiol can be maintained at lower doses, and whether its safety and tolerability can be improved. ■

Finding the Best Path to Palliative Care

A \$12 million grant to the Ronald O. Perelman Department of Emergency Medicine aims to better meet the needs of elderly patients.

WHEN IT COMES to providing older patients with palliative care—managing their symptoms, pain, and stress to improve quality of life—perhaps the last place that comes to mind is a fast-paced emergency department (ED). But with palliative care designated the newest subspecialty in emergency medicine, EDs are playing an increasingly larger role in this effort. Studies point to numerous benefits for initiating palliative care in the ED, including better control of symptoms, improved outcomes, shorter hospital length of stay, less need for intensive care, reduced family depression, higher patient and family satisfaction, and overall cost savings.

“The ED is an opportune place for establishing a comprehensive, long-term care plan with older patients and their families,” explains Corita Grudzen, MD, vice chair for research in NYU Langone Health’s Ronald O. Perelman Department of Emergency Medicine. That’s because some 75% of Americans 65 or older visit an ED in the last six months of life. At NYU Langone’s Ronald O. Perelman Center for Emergency Services, 25% of ED patients—about 18,000 annually—are 65 or older.

In December, Dr. Grudzen, a nationally recognized expert on palliative care in the ED, became the primary investigator of a multisite national study to research how palliative care can be delivered most efficiently, and how it can best satisfy the goals and preferences of patients and their families. The \$12 million study, funded by the Patient Centered Outcomes Research Institute, represents the largest grant in the history of NYU Langone’s Department of Emergency Medicine. It will gather data from nine diverse EDs over the next five years, including those at NYU Langone, NYU Langone



Hospital–Brooklyn, and Bellevue Hospital Center. At NYU Langone, the project will draw upon the expertise of the Division of Geriatrics in the Department of Medicine, the Department of Population Health, and NYU College of Nursing. Last year, NYU Langone was accredited by the Joint Commission in recognition of its overall excellence in palliative care.

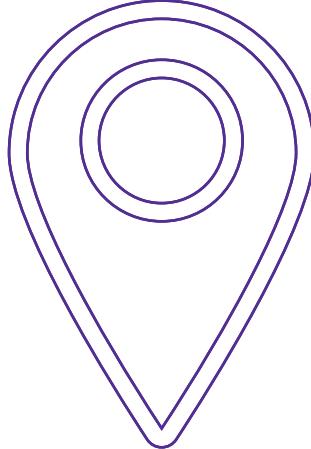
When older patients with serious illnesses are discharged from an ED, they may have access to a palliative care physician in an outpatient setting who facilitates medical treatment and psychosocial support. However, such specialists are in short supply nationwide. Even when a palliative care physician is available, in-person patient visits are costly and difficult for frail patients to maintain. A more practical option has emerged: specially trained nurses who coordinate patient care by phone. This novel approach has never been rigorously studied, but the grant will enable Dr. Grudzen’s research team to systematically compare it to the physician model to determine which one is more effective. “Under Dr.

Grudzen’s leadership, emergency medicine research at NYU Langone continues to tackle some of healthcare’s biggest challenges,” says Robert Femia, MD, chair of the Department of Emergency Medicine. “This study exemplifies our commitment to finding novel approaches that will improve patients’ lives.”

The new study is recruiting more than 1,300 volunteers, along with some of their personal caregivers. Patients are eligible for the study if they are 65 or older and living at home with advanced cancer or end-stage organ failure. Upon discharge from the ED, a participating patient is randomly assigned to a palliative care specialist—either a nurse who monitors the patient by phone or a physician who sees the patient in an outpatient setting. Both kinds of practitioners evaluate the same patient- and caregiver-centered measures, such as the alleviation of symptoms, clinical resources that are utilized, and quality of life. “We’ll find out not only which model of care works better, but why,” says Dr. Grudzen, “so that it can be replicated at other institutions.” ■

AMBULATORY CARE

NYU Langone Health Offers Urgent Care on Manhattan’s West Side



Where

NYU Langone Urgent Care at Ambulatory Care West Side, 355 West 52nd Street.

Call 646-754-2599 or visit nyulangone.org/locations/nyu-langone-ambulatory-care-west-side/urgent-care-at-nyu-langone-ambulatory-care-west-side.

What's new

Ambulatory Care West Side is the first of NYU Langone’s large

multispecialty ambulatory care sites to offer urgent care services. This new model of urgent care will better serve existing and prospective patients by building on our established expertise and familiar presence in neighborhoods throughout the New York City area.

Patient care

Walk-in urgent care services for adults with injuries and illnesses that are not life-

threatening emergencies but require prompt medical attention.

Benefits

- ▶ Prompt, convenient medical care provided by a board-certified physician trained in urgent care.
- ▶ Referrals to NYU Langone’s vast network of primary care physicians and specialists for follow-up care.
- ▶ Access to an array of patient services available

through Epic, NYU Langone’s electronic medical record system.

On-site diagnostic services

X-rays and blood tests

Hours

Monday–Friday:
9:00 a.m.–9:00 p.m.;
Saturday:
9:00 a.m.–1:00 p.m.

PERSPECTIVES

Hypertension: How Low Should We Go?

Two of NYU Langone Health's top experts on high blood pressure sort out new recommendations designed to stem a growing epidemic.

Under new guidelines recently issued by the American Heart Association and the American College of Cardiology, the number of adult Americans diagnosed with high blood pressure will rise from 72 million to 103 million. The 192-page report, more than a decade in the making, contains 106 recommendations. News & Views asked two of NYU Langone Health's leading hypertension experts—Howard Weintraub, MD, clinical director of the Center for the Prevention of Cardiovascular Disease, and Gbenga Ogedegbe, MD, director of the Center for Healthful Behavior Change—about the highlights and their related concerns.

Do you consider the new guidelines for hypertension controversial?

Dr. Ogedegbe: I was surprised by some of the recommendations, particularly the one to treat patients with hypertension at a lower threshold. We used to think that hypertension occurs with blood pressure readings above 140/90 on two or more office visits. The new guidelines are 130/80. We're going to have a tsunami of new patients to treat. By lowering the threshold, we've made over one-third of our population hypertensive. Yellow is the new green.

Dr. Weintraub: When my colleagues and I reviewed treatment data two years ago, we felt that a systolic level between 120 and 130 would be the sweet spot—the level with the fewest side effects and greatest benefits—and this report harmonizes with that thinking. There used to be a “lower is better” mentality. Risks do fall as blood pressure falls, but if the levels fall too low, the risks rise again because enough blood isn't flowing to the brain or into the heart. I applaud these guidelines for emphasizing nonpharmacologic therapy for patients who are not at high risk. There's no medicine like no medicine.

Do you have any concerns about the new threshold?

Dr. Ogedegbe: The moment you label someone with a disease, you change their self-perception—and their quality of life. This, in turn, has been shown to lead to negative consequences, such as missed days at work, because people see themselves as sick. We need to think about how to deliver this new message. We don't want to add a stressor that will raise the patient's blood pressure, putting them at even greater risk.

Dr. Weintraub: The findings now extend to people with

diabetes, but no study has ever shown that these patients are better off with lower blood pressure. To me, this is a bit of a leap. However, patients with diabetes have always been thought to be at higher risk and hence deserving more aggressive therapy. I'm also concerned that some physicians will aim to get their patients' blood pressure even lower than the recommended level. That's when things can backfire.

What are the biggest challenges of implementing these recommendations?

Dr. Ogedegbe: We've got to

convince patients of their risk without scaring them. Otherwise, it's going to be difficult for physicians to put all this into practice. Also, people who have treatment-resistant hypertension require additional resources because we have to screen them for concomitant diseases, such as sleep disorders. Few practices have the wherewithal to do that.

Dr. Weintraub: The vast majority of hypertension is treated not by cardiologists but by those in primary care. These providers vary widely in their knowledge base and comfort level, so many are not likely to adopt aggressive, nuanced guidelines. The ramifications of this are huge because the potential benefit is going to be diluted.

Which populations are most at risk under these new guidelines?

Dr. Ogedegbe: About 48% of African Americans and 52% of African American women will now be diagnosed with hypertension. The reasons

are complex—education level, poverty, social determinants, access to care. But actually, everyone is at risk. We used to say that 25% of the adult population, regardless of race or ethnicity, had hypertension. Now, it will be about 40% of the adult population.

Are plant-based diets effective at keeping hypertension in check?

Dr. Ogedegbe: Studies show that a diet rich in fruits and vegetables can reduce blood pressure. Plants have a lot of potassium, which lowers blood pressure. But it's important to remember that up to 75% of the sodium we consume comes from processed foods. So going vegan won't help much unless you also control your salt intake.

Dr. Weintraub: I can torture anybody with a diet that brings down their blood pressure, but is it sustainable? I tell patients to stay away from processed foods, lose weight, and take medicine if it's appropriate.

Beyond high blood pressure, which other factors put people at risk?

Dr. Weintraub: The new guidelines go after everything—blood pressure, weight, lipids, blood sugar, smoking, and stress. This is how we have approached patients for years at the Center for the Prevention of Cardiovascular Disease. It's more work for healthcare practitioners, but does what's best for the patient. ■

TO FIND A DOCTOR who specializes in hypertension, call 212-263-5162 or visit nyulangone.org/cvdprevention



Dr. Gbenga Ogedegbe and Dr. Howard Weintraub are two of NYU Langone's most prominent hypertension specialists.

Awards & Accolades

Society for Neuroscience Honors Moses Chao, PhD, Its Former President



MOSES CHAO, PhD, a neuroscientist at NYU Langone's Skirball Institute of Biomolecular Medicine, was honored with the Julius Axelrod Prize by the Society for Neuroscience. The \$25,000 award, funded by the Eli Lilly and Company Foundation, recognizes exceptional achievements in neuropharmacology or a related field and exemplary efforts in mentoring young scientists. Dr. Chao's work has contributed significantly to the body of knowledge on nerve growth factors and receptor signaling, and has yielded important discoveries in how neurotrophins nourish neurons, guide axons to form their proper connections, and promote their survival.

Pew Charitable Trusts Funds Collaborative Work by Research Partners

Neuroscientist **ROBERT FROEMKE, PhD**, and immunologist **DAN LITTMAN, MD, PhD**, were one of six teams of basic scientists nationwide awarded a grant through the Pew Charitable Trusts' new Innovation Fund. The grant, bestowed on alumni of Pew's biomedical program, promotes interdisciplinary collaboration to yield cutting-edge discoveries. Dr. Froemke and Dr. Littman, the Helen L. and Martin S. Kimmel



Professor of Molecular Immunology and a Howard Hughes Medical Institute investigator, are both members of NYU Langone Health's Skirball Institute of Biomolecular Medicine. The \$200,000 award will help them explore how the neuronal sensing of gut microbes and intestinal function can alter an animal's behavior. A better understanding of this process may help scientists map how information is relayed from the gut to the nervous system to promote healing.



Gbenga Ogedegbe, MD, Elected to the National Academy of Medicine

GBENGA OGEDEGBE, MD, the Dr. Adolph and Margaret Berger Professor of Population Health and Medicine, has been elected to the National Academy of Medicine, one of the highest honors in the fields of health and medicine. Dr. Ogedegbe joins more than 2,000 physicians worldwide, including 50 Nobel laureates, elected by their peers to recognize their outstanding professional achievement and commit-



ment to service. As director of the Division of Health and Behavior and director of the Center for Healthful Behavior Change, he has dedicated himself to developing strategies to eliminate racial disparities in cardiovascular diseases and improve the outcomes of chronic diseases in minority populations. His novel strategies for managing hypertension include translating evidence-based interventions into community-based settings to ensure that those with poor access have their blood pressure tested. A native of Nigeria, Dr. Ogedegbe has expanded his work to Sub-Saharan Africa, where his efforts to improve hypertension control are funded by the National Institutes of Health.

For Adult Congenital Heart Disease, NYU Langone Becomes State's First Accredited Program

NYU LANGONE HEALTH is the first institution in New York State—and one of only 16 nationwide—to earn accreditation as an Adult Congenital Heart Disease Comprehensive Care Center from the Adult Congenital Heart Association (ACHA). To better serve the 1.3 million Americans living with congenital heart disease—the most common birth defect, affecting about 1% of the population—ACHA established standards and protocols to ensure optimal patient-centered care. "Because these patients are living longer, there is an unmet need to treat them with the latest medical advances," says Dan Halpern, MD, director of NYU Langone's Adult Congenital Heart Disease Program. "This accreditation reflects our commitment to patients and enables us to provide them with the finest possible care as a unified, multidisciplinary team."

Two Hospitals, One Certification for Stroke

TISCH HOSPITAL AND NYU Langone Hospital-Brooklyn have been recertified as a Comprehensive Stroke Center by the Joint Commission, an independent accreditation organization responsible for certifying that some 17,000 US healthcare institutions are following the best practices for quality, safety, and patient care. While each hospital had previously received the designation separately, this is the first time the two campuses were certified together, as a single program. Stroke is the fifth leading cause of death, claiming the lives of more than 130,000 Americans annually, but it has dropped from third to fifth because of programs like those implemented by NYU Langone Health that have increased awareness of the risks and warning signs. NYU Langone's Comprehensive Stroke Center treats more than 1,400 patients every year.



Repeat Recognition for Patient-Centered Care

NYU LANGONE HEALTH was honored with two awards for delivering outstanding patient care from Vizient, Inc.—formerly the University HealthSystem Consortium—the nation's largest member-driven healthcare-performance-improvement company. The 2017 Bernard A. Birnbaum, MD, Quality Leadership Award, named in memory of NYU Langone's former chief of hospital operations, recognizes superior quality and safety performance, and NYU Langone has received this honor for the past five years. The Vizient 2017 Ambulatory Care Quality and Accountability Award was given to our faculty group practice network for excellence in patient-centered outpatient care. This marks the third consecutive year that the network has ranked number one among more than 200 participating academic medical centers and community hospitals nationwide.



Nursing at NYU Langone Orthopedic Hospital Lauded for Excellence

FOR THE SECOND time, NYU Langone Orthopedic Hospital has earned Magnet designation from the American Nurses Credentialing Center, an accrediting body that recognizes healthcare institutions for their excellence in nursing. Only 8% of the more than 5,400 accredited hospitals in the US achieve Magnet status, considered the gold standard for nursing, and only 5% receive the distinction twice in a row. NYU Langone Orthopedic Hospital was cited for practices that help set the highest standards for other hospitals. The Magnet Recognition Program advances nursing practices worldwide, providing numerous benefits—among them, lower mortality rates, shorter lengths of stay, higher patient satisfaction, and better rates of retention and recruitment.

NYU Langone Garners Highest Marks from CMS

NYU LANGONE HEALTH has received a five-star rating for overall quality, safety, and patient experience from the Centers for Medicare and Medicaid Services, the federal agency that oversees quality and care for Medicare and Medicaid beneficiaries. Only 9% of the more than 4,000 hospitals evaluated nationwide earn this highest score, and NYU Langone is the only full-service hospital in New York State to earn a five-star distinction. The star rating offers consumers a simple guide to healthcare institutions based on rigorous metrics. NYU Langone exceeded the national averages for safety, low mortality rates, hospital readmissions, and efficient use of medical imaging. ■

NEW FACES

Appointments & Recruitments

Transplant Institute and Perlmutter Cancer Center expand services with distinguished recruits.

NADER MOAZAMI, MD, has been appointed surgical director of heart transplantation and mechanical circulatory support. He is spearheading NYU Langone Health's new heart transplant program, recently launched by its Transplant Institute, Department of Cardiothoracic Surgery, and the Leon H. Charney Division of Cardiology. In January, Dr. Moazami performed NYU Langone's first heart transplant, one of more than 300 such lifesaving procedures he has performed in his career. Dr. Moazami previously led the cardiac transplant program at the Cleveland Clinic, where he achieved an international reputation for excellence. NYU Langone's new program offers a variety of surgical options for patients waiting for a heart transplant, including lifesaving mechanical devices that improve a patient's quality of life or serve as a bridge to transplantation.

After earning his MD at Columbia University College of Physicians and Surgeons, Dr. Moazami completed his residency at Columbia-Presbyterian Medical Center, where, as chief resident, he participated in the thoracic organ procurement team. He completed a fellowship in cardiothoracic surgery at the Cleveland Clinic. A prolific researcher, Dr. Moazami has published more than 100 articles in leading scientific journals and has been the principal investigator on more than two dozen clinical trials to study mechanical assist devices and other therapies for end-stage heart failure.

DIANE SIMEONE, MD, has been named director of the new Pancreatic Cancer Center and associate director for translational research at NYU Langone Health's Laura and Isaac Perlmutter Cancer Center. A surgeon and internationally renowned researcher with a long-standing focus on pancreatic cancer and pancreatic cystic tumors, she has performed more than 1,000 pancreatic operations and has developed clinical trials for innovative therapeutics. Dr. Simeone, the Laura and Isaac Perlmutter Professor of Surgery, leads a large clinical research program that is working to develop a blood test for early detection of pancreatic cancer. She is the principal investigator of Precision Promise, a new national consortium devoted to next-generation clinical trials. Previously, Dr. Simeone served as director of the gastrointestinal oncology program at the University of Michigan Comprehensive Cancer Center.

By 2020, pancreatic cancer is expected to become the second-highest cause of cancer death in the US. Dr. Simeone chairs the Scientific and Medical Advisory Board of the Pancreatic Cancer Action Network, a leading advocacy organization. After earning her MD from Duke University, she completed a residency in general surgery at the University of Michigan Medical Center. Dr. Simeone is a member of the Institute of Medicine of the National Academy of Sciences and the National Cancer Institute's Pancreatic Cancer Task Force.

RAOUL TIBES, MD, PhD, has been appointed director of the Clinical Leukemia Program at NYU Langone Health's Laura and Isaac Perlmutter Cancer Center. A nationally renowned physician and researcher, he joins NYU Langone from the Mayo Clinic's Arizona facilities in Scottsdale and Phoenix, where he served as a consultant for their leukemia program. Dr. Tibes' research focuses on developing more effective therapies for acute myeloid leukemia (AML), myelodysplastic syndromes (MDS), and myeloproliferative neoplasm (MPNs), employing functional genomics, as well as identifying mechanisms of resistance to current therapies. His laboratory work led to the development of several first-of-their-kind clinical trials for AML, MDS, and MPNs. In addition, he spearheads the development of DNA damage and cell cycle checkpoint inhibitory drugs in AML.

After earning his MD and PhD from Ludwig Maximilian University Medical School in Munich, Dr. Tibes completed his residency at NYU School of Medicine and a fellowship in medical oncology and hematology at MD Anderson Cancer Center in Houston. He has published more than 70 articles in scientific journals and was recently named a Scholar in Clinical Research by the Leukemia and Lymphoma Society. ▀



CLINICAL TRIALS

THE ENVIRONMENT AND CHILD HEALTH



THE NYU CHILDREN'S Environmental Health Study—part of an \$8.9 million grant awarded to epidemiologist Leonardo Trasande, MD, by the National Institutes of

Health—has recruited more than 1,000 pregnant women at Tisch Hospital, NYU Langone Hospital-Brooklyn, and Bellevue Hospital Center to study how exposure to environmental factors influences children's health outcomes around the time of birth and later in childhood or adolescence. Dr. Trasande's team is following participants throughout their pregnancies and into the first few years of their babies' lives to examine how air pollution, environmental chemicals, stress, sleep, diet, and other factors may predispose them to asthma, obesity, diabetes, autism, and attention deficit disorder. Without invasive procedures, the researchers will collect specimens from women during pregnancy and at the time of their newborns' delivery, then test these specimens, as well as others collected after birth. The timing of environmental exposures is considered an important element, since research has shown that exposures during crucial developmental windows can have lifelong effects on health.

TREATING CORONARY ARTERY DISEASE



IN 2011, NYU Langone Health received \$84 million in funding from the National Institutes of Health—its largest grant ever—to lead an international study comparing the effectiveness of two initial treatment strategies, one conservative and the other more aggressive, for people with moderate to severe ischemia, or impaired blood flow.

Last December, the trial—conducted at more than 350 sites in 33 countries, including 115 medical centers in the US—hit its target recruitment goal of more than 5,000 patients. The study enrolled more than 8,000 patients and randomly assigned more than 5,000 who were fully eligible. Ischemia is the leading cause of death and disability worldwide, afflicting more than 17 million Americans and claiming some 450,000 lives annually. "This is a major step toward successfully achieving the aims of the trial," says the study's principal investigator, Judith Hochman, MD, the Harold Snyder Family Professor of Cardiology and director of NYU Langone's Cardiovascular Clinical Research Center. ▀

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550 First Avenue
New York, NY 10016

EDUCATION

ONE-TOUCH TEACHING FOR MD'S IN TRAINING

SOME THINGS ARE game changers. Some games change things. At NYU School of Medicine's Institute for Innovations in Medical Education (IIME), both are happening. IIME is pioneering tools and strategies to transform teaching and learning. The learner iPad (left), provided to each medical student and resident, combines two emerging technologies: apps and augmented, or "mixed," reality. "This interactive model not only shows the user a 3-D model of a beating heart," explains senior multimedia developer Gregory Dorsainville, "but allows the user to peel away layers to see how the heart actually functions, animating something that was previously static."

Augmented reality emerged from the entertainment and gaming fields, explains IIME's director, Marc Triola, MD, but it promises to revolutionize medicine and healthcare. "It may be 5 or 10 years away," says Dr. Triola, "but it's going to become an integral and indispensable part of the medical field."

These new technologies make learning not just easier, but more fun. Apple recently designated NYU School of Medicine a "distinguished school" for cultivating a continuously innovative environment that makes students excited and curious. ■

