

NEWS & VIEWS

Where Patient Care, Scientific Research, and Medical Education Meet
MAY/JUNE 2016

Surgeons Trade Scalpels for X-Ray Vision in New Operating Room

NYU LANGONE DEBUTS A SECOND, MORE ADVANCED "HYBRID" OPERATING ROOM TO MEET A GROWING DEMAND FOR NONINVASIVE SURGICAL OPTIONS.

A DECADE ago, most cardiac surgeons would have scoffed at the idea of repairing a heart valve through a tiny nick in the groin and then sending the patient home the next day without a single stitch. Today, that once-improbable procedure—known as transcatheter aortic valve replacement, or TAVR—is not only a reality, but an increasingly common alternative for patients too sick or frail for open heart surgery.

At NYU Langone, where the number of TAVR cases alone has jumped from 50 to over 350 cases in the past two years, the trend toward nonsurgical options for a growing list of heart, brain, and vascular conditions is evident in the

construction of a second state-of-the-art "hybrid" operating room, opened in April. The facility is built exclusively for TAVR and other procedures that require sophisticated imaging tools that enable surgeons to peer inside the body and navigate through blood vessels—all without making incisions. Some of the procedures commonly performed in the hybrid ORs involve repairing a mitral valve to restore normal blood flow

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▼ Dr. Mathew Williams in the new hybrid OR. Displayed on the screens are X-rays from a rare double heart-valve replacement.



LEADING EXPERTISE HELPS PATIENTS BREATHE EASIER

FOR PEOPLE WITH CHRONIC LUNG CONDITIONS, AN INNOVATIVE PULMONARY PROGRAM AT NYU LANGONE PROMISES LESS DISCOMFORT AND FASTER RECOVERIES.

OUR LUNGS take about 20,000 breaths per day, and as the only internal organs exposed to environmental hazards and contaminants,

they're uniquely vulnerable to damage. An estimated 40 million Americans suffer from a major respiratory condition, including lung cancer, asthma,

tuberculosis, and chronic obstructive pulmonary disease, which encompasses emphysema and chronic bronchitis.

"Unlike a lot of other tissues in the body, the lungs don't regenerate," explains pulmonologist Gaetane Michaud, MD, director of NYU Langone's new Interventional Pulmonology Program. "Exposure to environmental toxins can often set off a chain of injuries, putting you on a dangerous trajectory."

40

Million

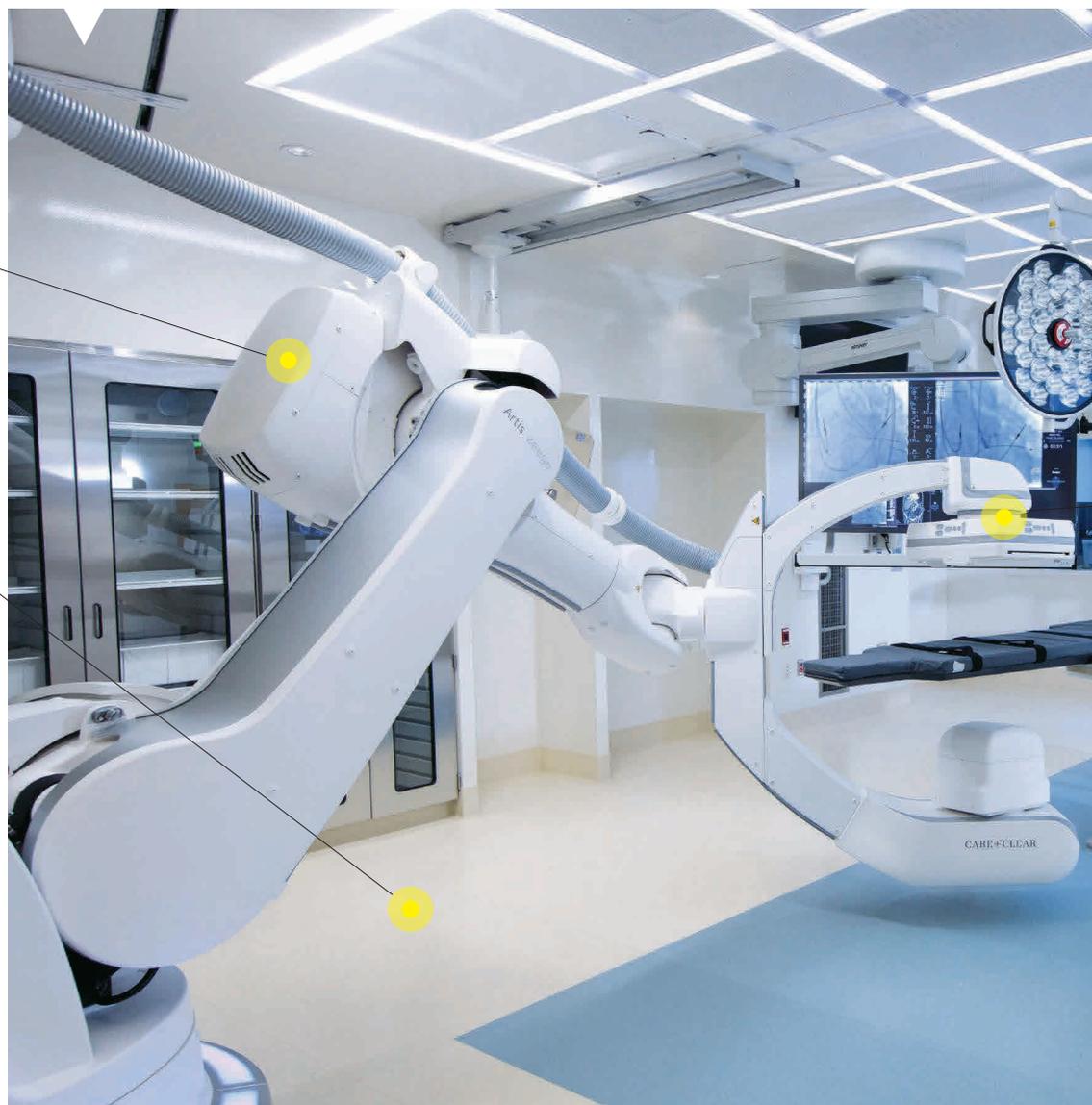
Americans suffer from a major chronic respiratory condition

When those injuries compromise the ability to breathe, Dr. Michaud's special training enables her to provide relief. She is a leading expert in interventional pulmonology, a relatively new area of pulmonary medicine that uses endoscopic tools and techniques to help patients with chronic lung conditions breathe easier. "In less than a year, Dr. Michaud and her

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The X-ray camera creates real-time images, as well as 3-D snapshots that can be sliced like a CT scan to show details of a targeted area.

Twice the size of a conventional operating theater, the hybrid OR holds more than three tons of imaging equipment, supported by a floor reinforced with structural steel.



(Continued from page 1)

Hybrid OR Offers the Best of Both Worlds

within the heart, repairing a weakened wall of the aorta or a blood vessel in the brain, and opening a narrowed artery to restore adequate blood supply to the brain. Together, the two ORs will accommodate more than 1,000 cases annually.

“Hybrid ORs have been a game changer,” explains Mathew Williams, MD, a pioneer in catheter-based heart valve repairs. “Without them, many of the most complex, minimally invasive cardiac, vascular, and neurovascular procedures would be difficult or even impossible.”

A hybrid OR combines a lead-lined catheterization lab—where radiological imaging techniques to visualize blood vessels are traditionally performed—with a conventional operating room equipped for open surgery. Such flexibility allows surgeons to more confidently treat exceedingly complex cases.

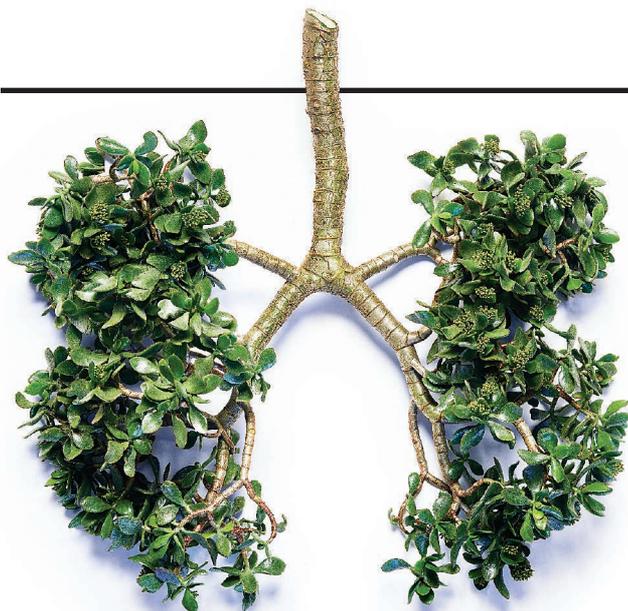
NYU Langone’s newest hybrid OR, located on the sixth floor of Tisch Hospital, features some of the fastest, most advanced imaging tools available, notes Michael Recht, MD, chair of the Department

of Radiology. Its centerpiece is a state-of-the-art low-dose X-ray machine with a robotic camera that can rotate to any position around the patient, affording views from any angle. For patients, the result is speedier, gentler procedures that require less anesthesia and shorter hospital stays. In

fact, patients who undergo TAVR procedures typically go home the next day.

In recent years, the demand for hybrid ORs has soared nationwide, fueled by the popularity of less invasive surgical techniques, the needs of an aging population with multiple chronic diseases, and

the advances of ever more sophisticated imaging technology and surgical procedures. Aubrey Galloway, MD, chair of the Department of Cardiothoracic Surgery, notes that just seven years ago, all cardiac valve repairs and replacements, for instance, required a surgical approach. In the



(Continued from page 1)

BREATHING EASIER

team have built the most comprehensive interventional pulmonology program in the New York metropolitan area,” notes Daniel Serman, MD, director of the Division of Pulmonary, Critical Care, and Sleep Medicine. The group will launch a fellowship program next year and will soon lead clinical trials of cutting-edge minimally invasive treatments for lung cancer and other serious pulmonary disorders.

Since interventional pulmonology emerged

in late 1990s, it has dramatically changed medicine’s approach to lung disease, including the way lung cancer is diagnosed, staged, and treated. About 80% of the patients treated by NYU Langone’s interventional pulmonologists have lung cancer.

“With personalized medicine,” Dr. Michaud explains, “we look for specific targets of therapy, and minimally invasive techniques enable us to get a lot of tissue samples without subjecting the patient to surgery in many cases.”

Half of all patients with lung cancer will develop fluid in their lungs or chest cavity,



The room's 60-inch-diagonal screens have a resolution four times greater than standard HD monitors, displaying images with exceptional clarity.

The X-ray camera and operating table are synchronized to provide multiple views of the surgical site.

The surgeon controls the high-tech equipment using videogame-like joysticks and a touch-screen keypad.

To prevent radiation from escaping, the room is fully lined with lead shielding.

next two years, he predicts, as many as 40% of patients who require such procedures will be treated with a catheter-based technique.

To stay ahead of the curve, the new Helen L. and Martin S. Kimmel Pavilion, set to open in 2018, will be built with all the infrastructure

needed to accommodate at least four new hybrid ORs. "Hybrid ORs are no longer revolutionary technology," says Dr. Galloway, "but they facilitate revolutionary techniques."

Dr. Williams, director of the Heart Valve Center at NYU Langone, has a unique perspective on hybrid ORs.

He was the first surgeon in the US to be dual-trained in interventional cardiology, which relies heavily on catheterization labs, and cardiac surgery, which specializes in open surgery. "Simply put," says Dr. Williams, "hybrid ORs combine the best of both worlds." ■

Since interventional pulmonology emerged in late 1990s, it has dramatically changed medicine's approach to lung disease, including the way lung cancer is diagnosed, staged, and treated.

and one-third will experience a blocked airway—conditions that can be treated by interventional pulmonologists.

"Our less invasive approaches have shifted a lot of care from the hospital to outpatient settings, minimizing the time patients spend away from their families," notes Dr. Michaud. "This has resulted in fewer readmissions, fewer visits to the Emergency Department, better quality of life, and higher patient satisfaction. Our outcomes are second to none." ■

TO FIND A DOCTOR who treats chronic respiratory diseases, call 212-263-7951, or visit nyulangone.org/lungconditions.

AT NYU LANGONE, DOCTORS HAVE THEIR PATIENTS' BACKS

RESOURCEFUL DERMATOLOGISTS HARNESS THE SELFIE CRAZE TO HELP PATIENTS DETECT MELANOMA IN ITS EARLY STAGES.

CHECKING YOUR SKIN for potentially cancerous spots is a fairly simple process—until it's time to inspect your back. If no one is available to help, you can stand with your back to a full-length mirror and use a hand-held mirror. But dermatologists at NYU Langone's Ronald O. Perelman Department of Dermatology have devised a way to make self-examination of the back easier for patients and more informative for doctors. They are teaching their patients how to use a selfie stick to capture images of suspicious moles or lesions. "Using a selfie stick to take close-ups provides a more detailed view," explains Jennifer Stein, MD, PhD.

Dr. Stein says this technique is particularly useful for identifying abnormalities that could be signs of melanoma, the deadliest form of skin cancer. Some 30 years ago, dermatologists at NYU Langone developed and later refined the ABCDE guideline for educating the public to recognize early melanoma, where *A* stands for asymmetry, *B* for border, *C* for color, *D* for diameter, and *E* for evolving.

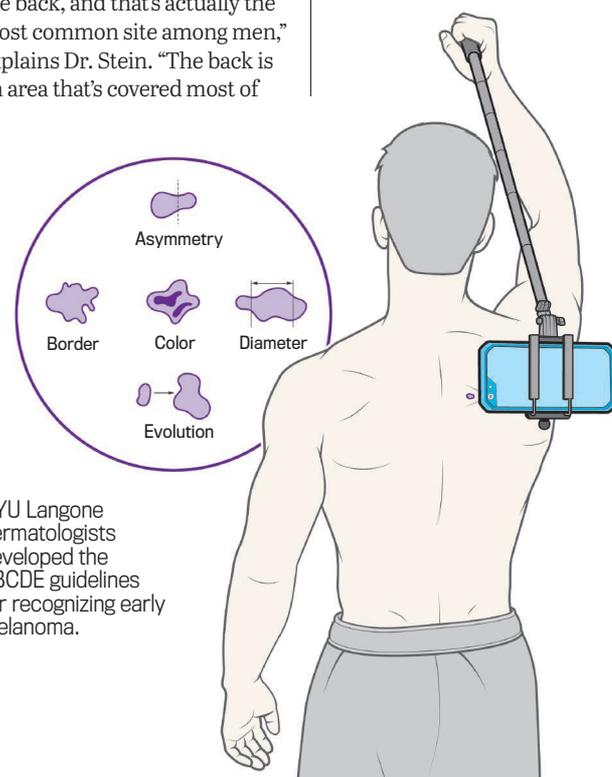
"Melanoma often appears on the back, and that's actually the most common site among men," explains Dr. Stein. "The back is an area that's covered most of

the year, then highly exposed to the sun during summer vacations." Such bursts of exposure, she says, may increase the likelihood of developing melanoma. Other risk factors include a personal or family history of skin cancer, abundant or atypical moles, fair skin, freckled skin, and indoor tanning.

Melanomas that penetrate the deeper layers of skin are more likely to spread to other organs and become lethal. These are often found in hard-to-examine areas, such as the back. "Melanomas tend to go unnoticed there," notes Dr. Stein. "The more time they have to grow, the worse the prognosis."

Dr. Stein's paper on the technique, "The Selfie Skin Examination," appears in the *Journal of the American Academy of Dermatology*, in an online-only feature that allows clinicians to share tricks of the trade. ■

TO FIND A DOCTOR who treats melanoma, call 212-263-5015, or visit nyulangone.org/melanomadoctors.



NYU Langone dermatologists developed the ABCDE guidelines for recognizing early melanoma.



WHEN THE WOUNDS OF WAR ARE A FAMILY AFFAIR

VETS AND THEIR LOVED ONES FIND A SECOND HOME AT NYU LANGONE'S MILITARY FAMILY CLINIC.

FOR MANY SOLDIERS returning from Iraq and Afghanistan, the physical combat ends, but the mental conflict rages on. An estimated 20% of the 2.8 million troops who have served in recent conflicts suffer from post-traumatic stress disorder (PTSD), a chronic disabling condition marked by anxiety, irritability, withdrawal, flashbacks, and suicidal impulses. Affected veterans experience

an array of often overlapping mental health issues, including depression, alcohol and drug abuse, and broken relationships. Yet few get the counseling and treatment they desperately need.

In 2012, to help veterans and active-duty servicemen and -women of all wars, NYU Langone established an outpatient mental health clinic: the Steven A. Cohen Military Family Clinic. Supported by

“The burden of deployment may be equal or even greater on the families,” notes Dr. Charles Marmar.

the Steven and Alexandra Cohen Foundation and other donors, the clinic provides free treatment to veterans and their family members who have been impacted by military service. Of the clinic's more than 800 patients, about 30% are family members—from spouses and children to grandparents and significant others—for whom treatment would not be available through the Veterans Administration healthcare system.

Family members with loved ones in combat zones face unique stressors: isolation, loneliness, anxiety, uncertainty. “The burden of deployment may be equal or even greater on the families,” notes Charles Marmar, MD, chair of the Department of Psychiatry, who has found in a series of landmark studies that hundreds of thousands of Vietnam veterans are still struggling with PTSD four decades later. “Fighters are trained to go to war and know what to do in war. Spouses and children are

in a helpless situation, not knowing if their loved ones are coming home. Military service disrupts the cohesion of the family back home.”

Beyond deployment stress, the clinic also helps families address common challenges of military life, such as relocation issues, school problems, and financial concerns. Its specialists tailor treatment to the individual, using a variety of proven approaches: talk-based therapies that help patients process and deal with traumatic events and address destructive cycles in their relationships, techniques that use rapid eye movements to dampen traumatic memories, and medication when necessary.

“Treatment typically lasts three to four months,” says Irina Komarovskaya, PhD, director of the clinic. “Our patients report substantial improvement—in their symptoms, how their family functions, and their quality of life.” ■

FOR MORE INFORMATION about the Steven A. Cohen Military Family Clinic, call 855-698-4677, or visit nyulangone.org/militaryfamilyclinic.

ZIKA'S OTHER THREAT

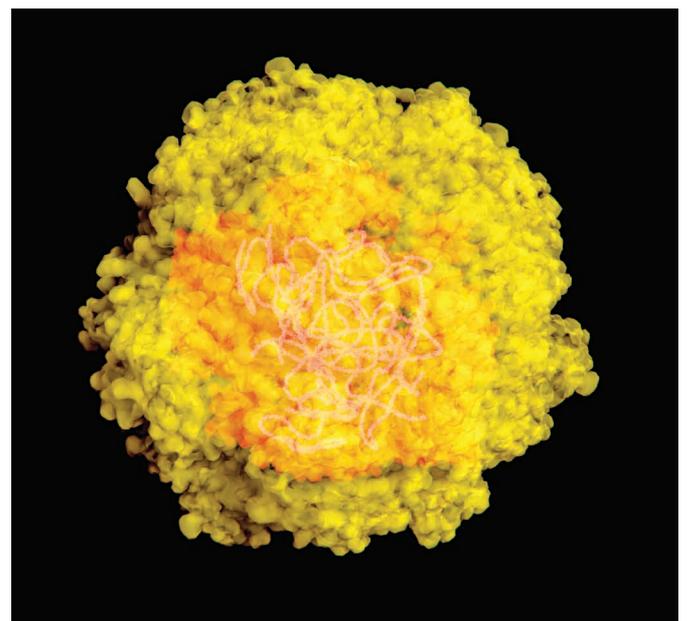
SOME PEOPLE INFECTED WITH THE MOSQUITO-BORNE VIRUS ACQUIRE GUILLAIN-BARRÉ SYNDROME. MICROBIOLOGIST DR. ANA RODRIGUEZ IS COLLABORATING WITH INTERNATIONAL RESEARCHERS TO UNDERSTAND WHY.

PUBLIC ATTENTION has been riveted on the Zika virus since it was linked to microcephaly in thousands of babies born in Brazil. As these cases surge, health officials have also noticed an uptick in Guillain-Barré syndrome among adults, a rare but serious autoimmune reaction associated with microbial infections that causes sudden muscle weakness and even temporary paralysis. Treatment often requires hospitalization.

Now, an innovative collaboration between Ana Rodriguez, PhD, a microbiologist at NYU Langone who studies autoimmune reactions in malaria, and Alexandre Morrot, PhD, a former NYU Langone immunologist now at the Federal University of Rio de Janeiro in Brazil, offers some of the first direct evidence linking Guillain-Barré syndrome and Zika infection.

In April, Dr. Morrot tested blood from eight Zika-infected Brazilians using kits Dr. Rodriguez custom-designed to detect a range of autoimmune antibodies associated with Guillain-Barré. All of the samples indeed revealed the presence of these so-called “anti-self” antibodies, while blood from healthy volunteers with no Zika exposure lacked the antibodies.

The scientists are now searching for antibodies in Zika-infected individuals with and without Guillain-Barré syndrome. Even though only a small percentage of people infected with Zika will develop the condition, there could be many cases as the virus spreads. Says Dr. Rodriguez, “People are just figuring out the numbers now.” ■



▼ Zika belongs to the same family of viruses that causes yellow fever and West Nile.

Five Things You Should Know about Endometriosis

THE DIRECTOR OF NYU LANGONE'S NEW ENDOMETRIOSIS CENTER OFFERS INSIGHT AND PERSPECTIVE ON MANAGING A PAINFUL AND OFTEN MISUNDERSTOOD DISEASE.

ENDOMETRIOSIS AFFECTS an estimated 10% of women of reproductive age, and yet the condition remains shrouded in mystery and misconceptions. The endometrium, or the specialized cells that normally line the uterus and are shed during menstruation, can attach and grow at other sites within the body. Typically, the cells adhere to the lining of the abdominal cavity or its organs, such as the colon, bladder, ovaries, and fallopian tubes, although they sometimes lodge farther away, such as in the chest.

Complications arise because the displaced cells still behave as if they were within the uterus, thickening and shedding during menstruation. Over time, the repeated shedding and pooling of blood can cause inflammation and scarring, often resulting in severe, debilitating pain and even infertility.

▼ Dr. Kathy Huang, who specializes in minimally invasive gynecologic surgery, has performed more than 1,600 robot-assisted procedures, many of them to treat endometriosis.



Though the condition is typically diagnosed in women in their 30s, symptoms begin much earlier—during the teen years.

“This is a frustrating and complex disease, with no known cause or cure,” explains gynecological surgeon Kathy Huang, MD, director of the new Endometriosis Center at NYU Langone. “To help women holistically, we’ve brought together experts in gynecology, reproductive medicine, surgery, radiology, pain management, pelvic floor therapy, and other specialties.” Here, Dr. Huang addresses some common issues regarding endometriosis.

1 No one really knows why endometrial cells turn up outside the uterus.

The most accepted theory is that not all of the cells shed during a woman’s period are expelled from the body. Some may travel backward through the fallopian tubes and into the abdomen, attaching to organs. This process, called retrograde menstruation, may occur in most women, and while many are able to clear the tissue naturally, others are not. Another theory is that some endometrial cells are absorbed into the bloodstream or lymphatic system and are simply carried away to distant sites. The most intriguing hypothesis relies on the potential of one type of cell to transform into another, a phenomenon known as metaplasia. In this scenario, normal cells may be stimulated by attached endometrial cells and the hormones that trigger menstruation to change into endometrial cells themselves. Heredity and a glitch in the body’s immune system may play parts as well.

2 Diagnosis is frequently missed, especially in teenagers.

Though the condition is typically diagnosed in women in their 30s, symptoms begin much earlier—during the teen years. “Unfortunately, young women are often told that intense pain is a normal burden of menstruation,” says Dr. Huang. “But severe pain is never normal.” Risk factors for endometriosis include a mother or sisters with the condition, and the onset of menstruation at age 11 or younger. “Early diagnosis prevents needless suffering and is the key to preserving fertility, since endometriosis

Endometriosis: Mysterious but Not Uncommon

10%

of women of reproductive age suffer from endometriosis



is a progressive disease,” notes Dr. Huang.

Adult women also get dismissed. “They’re often told the problem is all in their heads,” she adds. But even when complaints are taken seriously, diagnosis can lag because the symptoms may be mistakenly ascribed to other conditions, such as fibroids, ovarian cysts, irritable bowel syndrome, a urinary tract infection, or a sexually transmitted disease.

3 An MRI is often the best way to see hidden endometrial cells.

A variety of techniques are used to diagnose endometriosis, including pelvic exams and ultrasound, but it’s hard to spot all the embedded cells. The Endometriosis Center uses magnetic resonance imaging (MRI) because it often provides a clearer view of what’s happening internally. “This helps in assessing the extent of the disease, as well as in planning any surgery,” says Dr. Huang. “We have found that MRI offers 80% accuracy as a diagnostic tool for endometriosis.”

4 Endometriosis does not automatically doom women to infertility.

For various reasons, endometriosis seems to hinder fertility. One factor may be the scarring that obstructs the tubes, possibly preventing the sperm from reaching and fertilizing the egg. Nevertheless, women can usually become pregnant. “They just have a harder time and may require more help,” explains Dr. Huang. A study of 4,000 women with endometriosis found that while more than half didn’t conceive within a year of trying, 70% did eventually have a child.

5 Neither pregnancy nor a hysterectomy can cure endometriosis.

Pregnancy subdues the symptoms of endometriosis by eliminating the menstrual cycle. But after pregnancy, menstruation resumes, and symptoms will likely reappear. Many people think that by removing the uterus, and thus permanently eliminating the menstrual cycle, endometriosis will be eradicated. Not so. It is the ovaries that produce the estrogen and progesterone that stimulate shedding of the uterine lining, so unless they are removed as well, they will continue to stimulate escaped endometrial cells. While there is no cure, endometriosis is often treated with hormonal therapy to regulate or eliminate the menstrual cycle, or surgery to excise endometrial lesions. ■

TO FIND A DOCTOR who treats endometriosis, call 212-545-5400, or visit nyulangone.org/endometriosiscenter.

Dr. Stephen Ross on the Perils of Prescription Painkillers

AN ADDICTION SPECIALIST DISCUSSES THE DEADLY CONNECTION BETWEEN OPIOID MEDICATIONS AND HEROIN.

In February, the federal government announced it would seek more than \$1.1 billion to fight the spiraling epidemic of prescription painkiller abuse. Today, more than 2 million Americans are dependent on or abuse prescription opioids, a widely prescribed class of painkiller that includes oxycodone, hydrocodone, and morphine. In 2014, overdoses from such drugs killed an estimated 14,000 people in the US—triple the number in 1990. Stephen Ross, MD, director of Addiction Psychiatry at NYU Langone’s Tisch Hospital, and director of the Division of Alcoholism and Drug Abuse and the Opioid Overdose Prevention Program within the Psychiatry Service of Bellevue Hospital Center, shares his thoughts about this unprecedented epidemic and its link to a resurgence of heroin addiction.

What’s behind this alarming trend?

In 2001, the Joint Commission on Accreditation of Healthcare Organizations issued its pain management standards, which propagated the notion that pain is a “fifth vital sign.” It required healthcare providers to ask every patient about their pain, since the perception at the time was that pain was undertreated. This led to the unintended consequence: prescription opioids went from a treatment of last resort to a first-line therapy for chronic, nonmalignant pain syndromes. Yet there was little or no evidence that long-term use of opioids could successfully manage pain in this patient population. In the late 1990s, pharmaceutical companies had begun to aggressively market opioids for pain, downplaying their addictive liability. Because doctors typically have minimal training in addiction, many began to prescribe opioids to treat chronic pain syndromes without screening

for current addiction or risk factors associated with opioid addiction. Soaring prescriptions for opioids have caused an alarming increase in the incidence of addiction, treatment for addiction, and overdose fatalities. Today, opioids are the most commonly prescribed class of any medication. The other big issue is perception. When heroin is essentially packed into a pill, made and marketed by a pharmaceutical company, prescribed by a physician, and dispensed by a pharmacist, it doesn’t seem so dangerous. But the brain doesn’t differentiate heroin from a prescription opioid.

How have prescription opioids fueled the rise in heroin abuse?

Someone who becomes addicted to a prescription opioid needs to keep taking more and more of the drug to relieve pain or get high and prevent withdrawal

symptoms. But these are controlled substances that are legally available only by prescription, and they’re expensive. To an addict, heroin offers an attractive alternative. It’s very cheap and more potent than just about every prescription opioid, with the notable exception of street fentanyl, which is alarmingly becoming an opioid epidemic in and of itself. From 2010 to 2012, the mortality rate from heroin overdose doubled in 28 states.

So how do we combat these intertwined epidemics?

By developing abuse-resistant painkillers and creating more prescription-monitoring programs. Our biggest weapons, though, are public education and professional training. The recent CDC guidelines around opioid prescribing, and the involvement of the White House in combating opioid addiction are very important developments. Addiction is arguably the number one public health threat in the US, in terms of prevalence, morbidity, mortality, and societal cost. Very few physicians receive adequate training in addiction prevention and treatment. I’m proud to say that this is one of our areas of expertise at NYU Langone and that we offer fellowship training in addiction psychiatry. Only recently have hospitals begun to routinely screen for addiction and help people obtain proper care. This policy shift should help change behavior, but it will take time. ■

In Related News

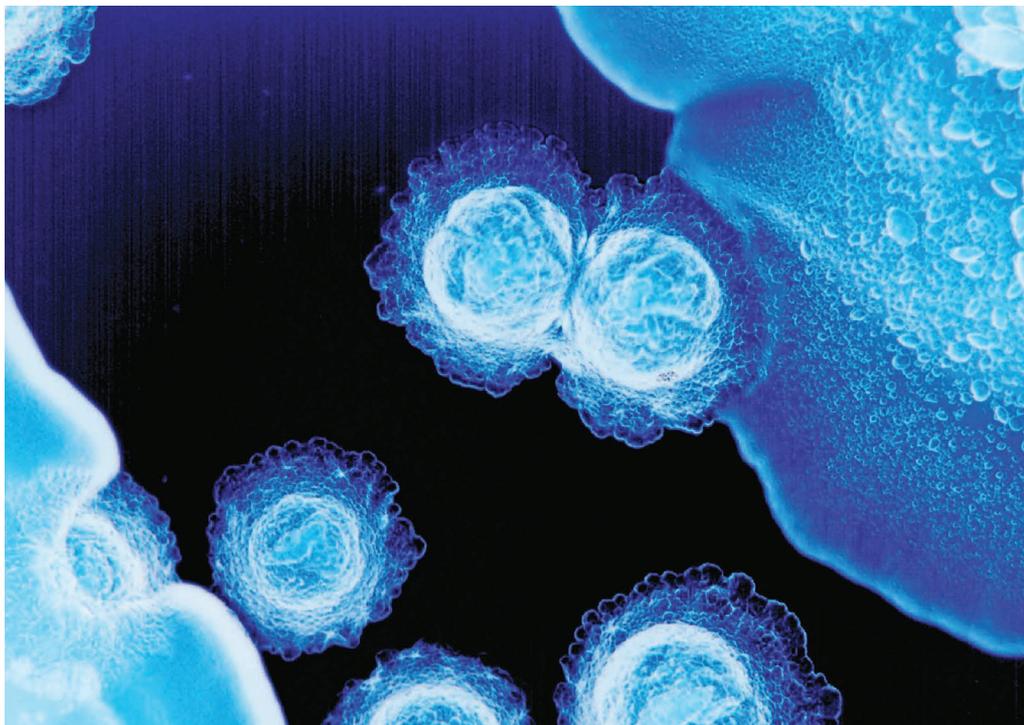
Can a Monthly Injection Safeguard against Opioid Relapse and Overdose?

Recently released prisoners addicted to heroin and other opioids typically do not receive the proven treatments—methadone and buprenorphine—because they don’t have access to them. Without such treatments, however, rates of relapse and overdose are very high. Now, NYU Langone epidemiologist and addiction specialist Joshua Lee, MD, has evaluated an alternative treatment strategy: a monthly injection of extended-release naltrexone, a medication that blocks the effects of opioids. In a recent study published in *The New England Journal of Medicine*, he and colleagues followed 153 participants who were given a monthly injection of extended-release naltrexone, and 155 who did not receive the drug. Both groups received motivational counseling and referrals to community treatment. After six months, 43% of those in the naltrexone group relapsed, compared to 64% of those who did not receive the injection. Moreover, no one taking naltrexone overdosed, compared to five cases in the other group. The study is part of a larger, national effort to address addiction in underserved populations and to reduce reincarceration rates.

TO FIND A DOCTOR who treats addiction, call NYU Langone’s Physician Referral Service at 888-769-8633.



PHOTO: ISTOCK BY GETTY IMAGES (MICHAEL KRINKEL), OPPOSITE PAGE PHOTOS: (TOP) DERREN READY; WELLCOME IMAGES; (BOTTOM) KARSTEEN MORAN



Some of the 700-plus species of bacteria that live in the mouth have been linked to heart disease and pancreatic cancer.

Another Good Reason to Kick the Habit

SMOKING DISRUPTS THE HEALTHY MIX OF MICROBES LIVING IN THE MOUTH, RESEARCHERS FIND, AND MAY SOW THE SEEDS FOR ORAL CANCER.

SCIENTISTS HAVE LONG known that poor oral hygiene and diet can help bacterial troublemakers in the mouth promote cavities and gum disease, and may even increase the risk of heart attacks, strokes, and cancer. Research led by Jiyoung Ahn, PhD, associate professor of population health and environmental medicine at NYU Langone, has now found that long-term smoking reshapes the oral microbial mix and depletes a group of bacteria that may defend the body against carcinogens found in tobacco.

Dr. Ahn's group analyzed the oral microbiome of more than 1,200 people: heavy smokers, nonsmokers, and former smokers. "The whole microbial ecology changes in people who smoke," she

says. The recently published study found a significant drop in a group of microbes called Proteobacteria among current smokers. "We looked at bacterial gene functions, and these bacteria play an important role in breaking down smoking carcinogens," she says. In other words, the study suggests that certain constituents of the oral microbiome may provide the first line of defense against carcinogens.

Dr. Ahn says follow-up studies may help determine whether the dip in Proteobacteria or other facets of the microbial shift may increase the risk of cancer and other diseases. So far, however, the research hints at another reason to stop smoking: among former smokers who had long since quit, the normal microbiome seemed to bounce back. ■

48

Thousand

Estimated number of US adults who will be diagnosed with oral or oropharyngeal cancer this year; tobacco use is the single biggest risk factor



UNMASKING THE GREAT MASQUERADER

A NEW PROGRAM TARGETS A POTENTIALLY FATAL HIDDEN HEART DEFECT.

WHEN THE PATIENT started to experience shortness of breath and fainting spells, he consulted a cardiologist. He was diagnosed with hypertrophic cardiomyopathy (HCM), an inherited condition affecting 1 in 500 people in which the heart muscle thickens, compromising the heart's ability to pump blood and beat rhythmically.

All too often, the complications of HCM are overlooked, or the disease itself is misdiagnosed or improperly treated. "HCM is the great masquerader," explains Mark Sherrid, MD, medical director of NYU Langone's new Hypertrophic Cardiomyopathy Program. With nearly 1,400 patients, the program is one of the largest of its kind in the country. "It looks like other cardiac diseases—and also noncardiac ones, from exercise-induced asthma to panic attacks. Moreover, the disease affects individuals differently, with a variety of symptoms." Complicating matters, HCM can strike adolescents and young adults, in whom heart problems are not expected to arise. In the US, it's the leading cause of sudden cardiac death among young athletes.

Treatments failed to help the patient, so he visited one cardiologist after another before finally consulting Dr. Sherrid, who asked him a simple question: "Do your symptoms get worse after eating?"

The patient's answer was an emphatic yes. Dr. Sherrid suspected that his patient's symptoms were due to obstructed blood flow from the left ventricle, a common complication of HCM. He confirmed the diagnosis with an ultrasound technique he had developed in 2013. He then prescribed a medication whose use he had pioneered specifically to help improve ventricular blood flow in patients with HCM. The patient's blackouts stopped, and his ability to exercise improved.

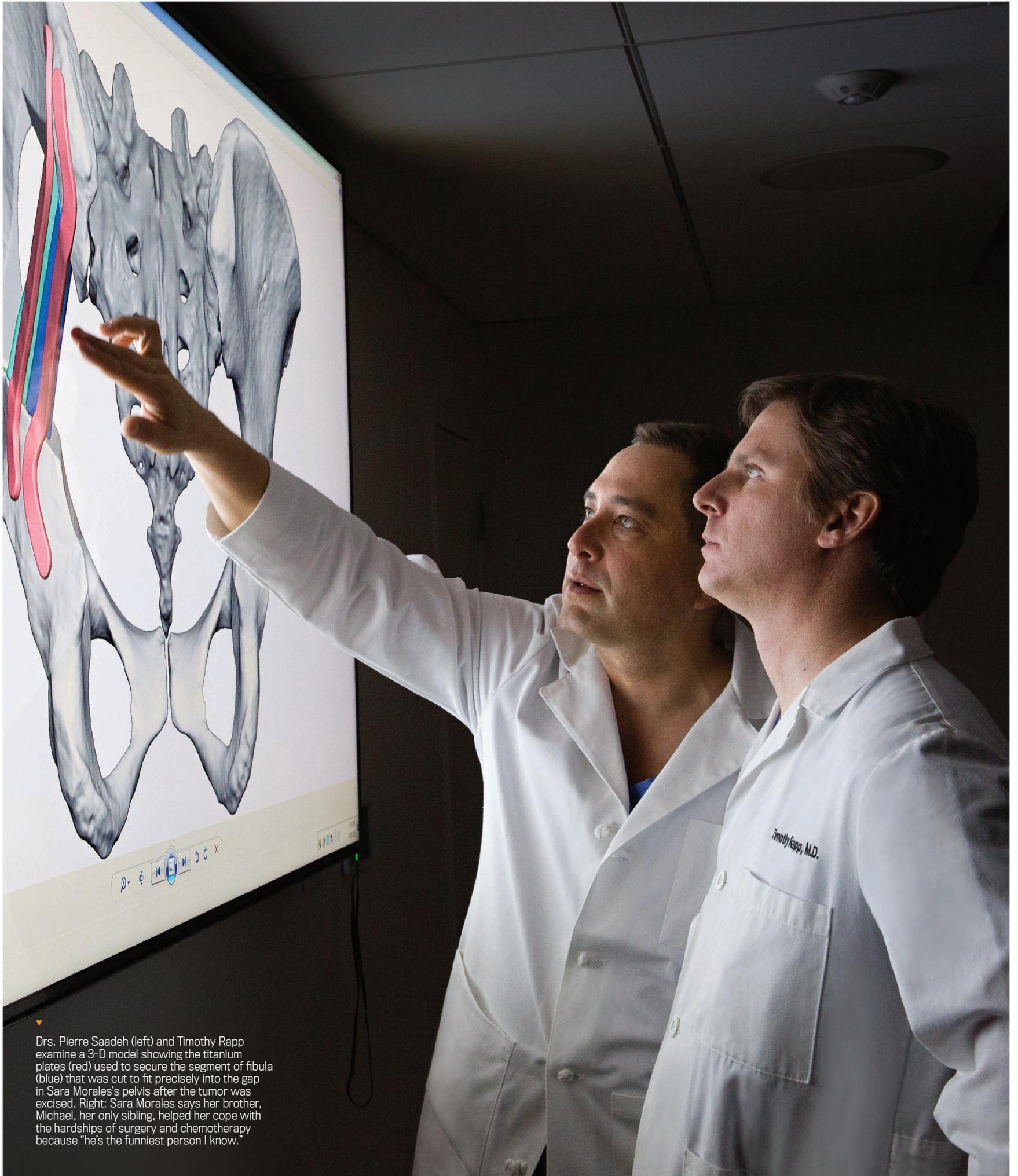
Many patients respond well to medication. For those who don't, there is a surgical option. The program's surgical director, cardiac surgeon Daniel Swistel, MD, has greatly improved a procedure that thins the wall separating the right and left sides of the heart.

"HCM used to be considered a disease with a very poor prognosis and few therapeutic options," notes Dr. Sherrid. "Now, we have methods to eliminate obstruction, alleviate symptoms, and improve quality of life. First-degree family members should be screened for the disease. With appropriate treatment, most patients can expect near-normal life expectancy." ■

Dr. Mark Sherrid (left) and Daniel Swistel, leaders of the new Hypertrophic Cardiomyopathy Program, estimate that about 40,000 people in the New York metropolitan area have the condition, but many have not been properly diagnosed.



TO FIND A DOCTOR who treats hypertrophic cardiomyopathy, call 646-501-0568, or visit nyulangone.org/hcmprogram.



▼ Drs. Pierre Saadeh (left) and Timothy Rapp examine a 3-D model showing the titanium plates (red) used to secure the segment of fibula (blue) that was cut to fit precisely into the gap in Sara Morales's pelvis after the tumor was excised. Right: Sara Morales says her brother, Michael, her only sibling, helped her cope with the hardships of surgery and chemotherapy because "he's the funniest person I know."

PHOTOS: BUD BLICK (OPPOSITE), JOSHUA BRIGHT

FROM VIRTUAL REALITY TO SURGICAL SUCCESS

FACED WITH THE PROSPECT OF BECOMING WHEELCHAIR BOUND, CANCER PATIENT SARA MORALES PUT HER TRUST IN TWO PIONEERING SURGEONS DETERMINED TO PRESERVE HER QUALITY OF LIFE.

AT FIRST, 32-year-old Sara Morales brushed off the hip pain as strain from daily physical therapy sessions for her new knee, the result of a rare bone tumor, an osteosarcoma, above her right shin. But the throbbing grew so intense that she could no longer put weight on the affected leg. An MRI, ordered by her doctors at NYU Langone, revealed a fractured pelvis. Worse still was the cause. A new tumor was growing in her pelvic bone near the sacroiliac joint, a critical juncture of the spine and legs. “Could this really be happening again?” Morales wondered.

“Treatment for the first cancer was the worst time in my life,” she says. “To have to go through all that again? I was devastated.”

With 800 cases diagnosed each year in the US, osteosarcoma most often strikes children and young adults, typically during growth spurts. The cause is unknown. Morales, a petite native Lower East Sider whose brief career teaching English as a second language was interrupted by her first bout with cancer, faced a good chance for recovery. As before, treatment would consist of chemotherapy followed by removal of the diseased bone, but this time the tumor resided in a difficult location. Not only was it behind a mass of critical organs, but it was on the curve of the pelvis, which bears the weight of the leg. To fully excise the tumor, half of Morales’s pel-

“This would be the first time part of a fibula would be inserted into a pelvis with the aid of 3-D technology,” explains Dr. Rapp, “but we didn’t see any reason why it couldn’t work.”

vis might need to be removed. Morales would most likely be confined to a wheelchair for the rest of her life.

“I didn’t want that for Sara,” says Timothy Rapp, MD, chief of the Division of Orthopaedic Oncology, who had removed her original tumor. He had a bold idea that might allow her to walk. With help from plastic surgeon Pierre Saadeh, MD, with whom he’d devised creative solutions for other complex surgical cases, Dr. Rapp thought that if he could find a way to fill the hole in Morales’s pelvis with healthy bone, it would preserve function of her hip and leg. Dr. Rapp relied on his expertise with hard-to-reach bone tumors, and Dr. Saadeh drew on his experience saving the limbs of accident victims as chief of plastic surgery at Bellevue Hospital Center.

Facing an extremely complex operation, the surgeons could leave nothing to chance. No artery, vein, nerve, or

muscle could be overlooked in the planning. When anatomy books failed to show Drs. Rapp and Saadeh the details they sought, they turned to software called BioDigital Human®, an interactive map of the human body that affords views of each organ and bone from every angle. “The pelvis is a curved bone,” explains Dr. Rapp, “so it’s much more difficult to anticipate the angles of the cuts, even if you have the best anatomical mind in the world.” While the traditional approach would be to access the pelvis through the abdomen, the surgeons determined that coming in from the back would cause less damage.

There was another challenge: figuring out how to stabilize the pelvis after removing a piece of bone measuring nearly three inches in diameter. Cutting out a chunk of bone that size would destabilize Morales’s pelvis. So the surgeons decided to take part of her fibula, the non-weight-bearing bone in the lower leg, to bridge the hole, using hardware to secure it in place. “This would be the first time part of a fibula would be inserted into a pelvis with the aid of 3-D technology,” explains Dr. Rapp, “but we didn’t see any reason why it couldn’t work.” In collaboration with a pioneer in 3-D printing technology, they used CT scans to customize plastic jigs to aid with the bone cutting. Using virtual

surgery software, the surgeons practiced the procedure on a screen for hours on end.

“It all sounded so futuristic,” says Morales. “But these men had saved my life before, and I’d seen what they were capable of. I trusted them. So I said okay.”

To shrink the tumor, Morales began rigorous chemotherapy under the care of Gerald Rosen, MD, director of the Medical Oncology Sarcoma Program at NYU Langone’s Laura and Isaac Perlmutter Cancer Center. She dyed her hair in a “happy” shade of pink and settled in with her brother, Michael, for marathon sessions with Netflix—her way of dealing with the discomfort and uncertainty.

The surgery was performed at Tisch Hospital on February 2, 2015. As Dr. Rapp, a member of the Perlmutter Cancer Center, worked to remove the tumor, Dr. Saadeh carved out a piece of the fibula. “The procedure was really a technical exercise because it was all planned out in advance,” says Dr. Saadeh. The surgeons recorded the seven-hour operation so that they

could present their pioneering approach at professional conferences and detail it in a peer-reviewed journal.

“Their partnership is truly state-of-the-art,” says Eduardo Rodriguez, MD, DDS, chair of the Hansjörg Wyss Department of Plastic Surgery. “The results are very remarkable—from convalescence and recovery to functional outcome.”

Last August, Dr. Rapp helped Morales onto her feet. Though weak and wobbly, she stood up, unassisted. First one crutch was put away, then the other. Morales can now walk several blocks, and she loves riding the stationary bike at the gym in anticipation of getting back on a real one this summer. “There’s so much I want to do now,” she says. “I want to get my life started and my career going and take a big trip and get married.” ■

TO FIND A DOCTOR who treats bone sarcoma, call 212-731-6558, or visit nyulangone.org/bonesarcoma.





BUILDING A BETTER DAD

A POPULAR WORKSHOP FOR EXPECTANT FATHERS TEACHES THE ABC'S OF BABY WRANGLING.

ON A RECENT Saturday morning, in a conference room at NYU Langone, 15 expectant fathers gathered around a six-month-old boy named Aiden. They watched with curiosity and a certain sense of wonder as the baby, wriggling in his car seat, teethed on a plastic

giraffe. “What would you like to know?” asked the group’s facilitator, Nick Cook, an affable father of two. The questions came fast: *Is it true newborns shouldn’t go outside? How do you change a diaper? What can I do for my wife while she’s nursing?*

Many expectant fathers who attend the workshop say that it boosts their confidence in caring for their baby and supporting their partner, and most report that they become deeply engaged dads.

Welcome to Boot Camp for New Dads, one of more than a dozen classes for new and expectant parents offered by NYU Langone’s Parent Education Program—and the only one exclusively for men. The three-hour workshop—the only hospital-based offering of its kind in New York City—is run by a trained coach and is available for a nominal fee. The first hour covers broad topics, such as caring for new moms. Next, prospective pops get practical training from seasoned veterans (graduates of previous Boot Camps), who bring along their babies to demonstrate such skills as what to do when a baby cries. The third hour offers some hands-on caregiving tips and advice on everything from father-child bonding and balancing work and parenting, to financial planning and dealing with relatives.

Studies have shown, notes Gladys Vallespir-Ellett, RN, that kids whose fathers are closely involved at an early age perform better in every area of life.

“The father-to-father support provides a safe environment for men to ask questions without worrying that they’ll seem foolish,” explains Gladys Vallespir-Ellett, RN, the Parent Education Program coordinator. “The course fosters a more sensitive, self-assured, and hands-on parenting style.” Studies have shown, notes Vallespir-Ellett, that kids whose fathers are closely involved at an early age perform better in every area of life. ■

To enroll in Boot Camp for New Dads, call 212-263-7201, or visit nyulangone.org/dadbootcamp.

An Unforgettable Fright

NYU LANGONE RESEARCHERS UNCOVER A BRAIN CIRCUIT THAT HELPS US LEARN, REMEMBER, AND AVOID DANGEROUS PLACES.

A CREEPY BASEMENT, a dark alley, a snake pit—scary places are hard to forget. That’s a good thing because the memories help us avoid similar environments in the future. Now, NYU Langone neuroscientist Jayeeta Basu, PhD, and her colleagues have identified an intricate chain of signals in the brain that may explain how this potentially lifesaving memory feat works. Her research, recently published in the journal *Science*, holds important implications for a range of disorders involving memory, including Alzheimer’s, schizophrenia, and post-traumatic stress disorder.

The ability to form and recall associations between people, places, and things depends on the interplay between two brain regions, the hippocampus, a seahorse-shaped structure in the temporal lobe, and the entorhinal cortex, a nearby area that feeds it spatial information. In a series of rodent experiments, Dr. Basu

disabled a cellular pathway connecting these two regions, and then placed the mice in a room where they received a brief but unpleasant jolt to the foot. With the pathway blocked, mice grew fearful when they were reintroduced to the “danger room” 24 hours later, as expected, but they also expressed fear when placed in a different, nonthreatening room. Healthy mice, by contrast, learned to discriminate between threatening and nonthreatening spaces. “We’ve found that the pathway controls the flow of contextual information through the hippocampus during frightening encounters and allows precise memories to form,” says Dr. Basu. “Without the pathway, fear memories become overgeneralized.” A similar pathway may be at play when unthreatening environments trigger fearful memories in people who suffer from PTSD. ■

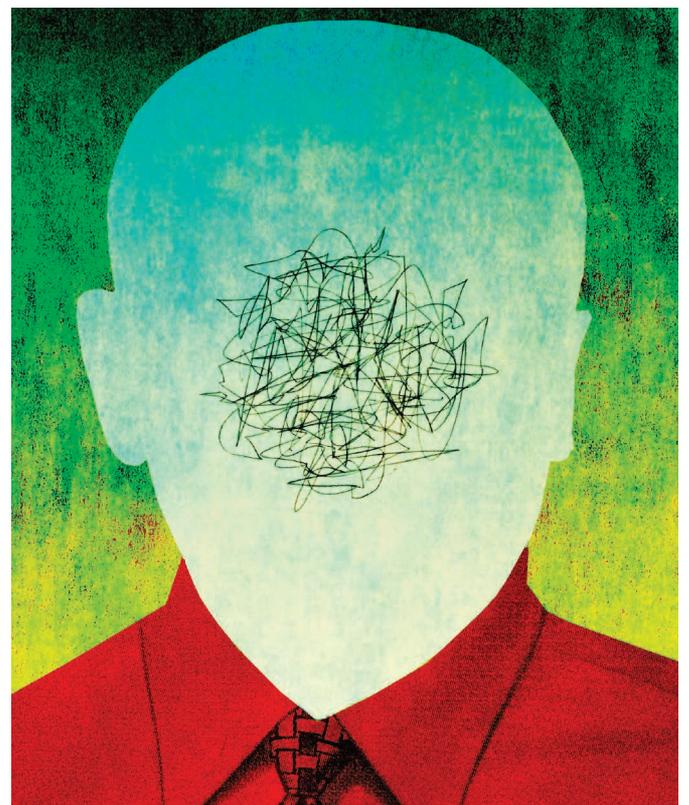


PHOTO: JOSHUA BRIGHT; ILLUSTRATION: BRIAN STAUFFER / THE SPOT; (OPPOSITE) DEVON RYAN PHOTO: SASHA WALLA

MILESTONES & NEWSMAKERS

DIRECTOR NAMED FOR COMPUTATIONAL MEDICINE INSTITUTE; CHIEF SCIENTIFIC OFFICER ELECTED TO PRESTIGIOUS CANCER RESEARCH BOARD; NEW CHAIR TO LEAD DEPARTMENT OF CHILD AND ADOLESCENT PSYCHIATRY.



AITAI YANAI, PHD, has been named the inaugural director of the Institute for Computational Medicine, a hub for multidisciplinary research applying computational biology to medical challenges and tackling biological systems that are vast, complex, and dynamic. Dr. Yanai, professor of biochemistry and molecular pharmacology, comes from the Technion-Israel Institute of Technology, where he explored the evolutionary influences on gene regulation in embryonic development and pioneered a widely used method for analyzing gene expression in single cells. He and his colleagues are currently using this method to investigate the progression of cancer and the process of infection. Dr. Yanai earned his PhD in bioinformatics from Boston University.

Research (AACR) for the 2016–2019 term. One of the country's leading cancer biologists, Dr. Bar-Sagi is widely known for elucidating cellular pathways involved in controlling cell growth. She has published more than 100 papers on the molecular mechanisms underlying tumor development. The AACR, the world's oldest and largest professional organization dedicated to advancing cancer research, aims to prevent and cure cancer through research, education, communication, and collaboration.



HELEN EGGER, MD, has been named chair of the Department of Child and Adolescent Psychiatry and director of the Child Study Center at NYU Langone. She joins NYU Langone in September from Duke University Medical Center, where she is currently chief of the Division of Child and Family Mental Health and Developmental Neuroscience. In addition to her study of anxiety disorders in children from birth to age five, Dr. Egger's current research focuses on developing innovative tools to gather and analyze information about a child's behaviors. Among these tools is an experimental iPhone app that provides parents and caregivers with a simple tool to screen for autism and other disorders. ■

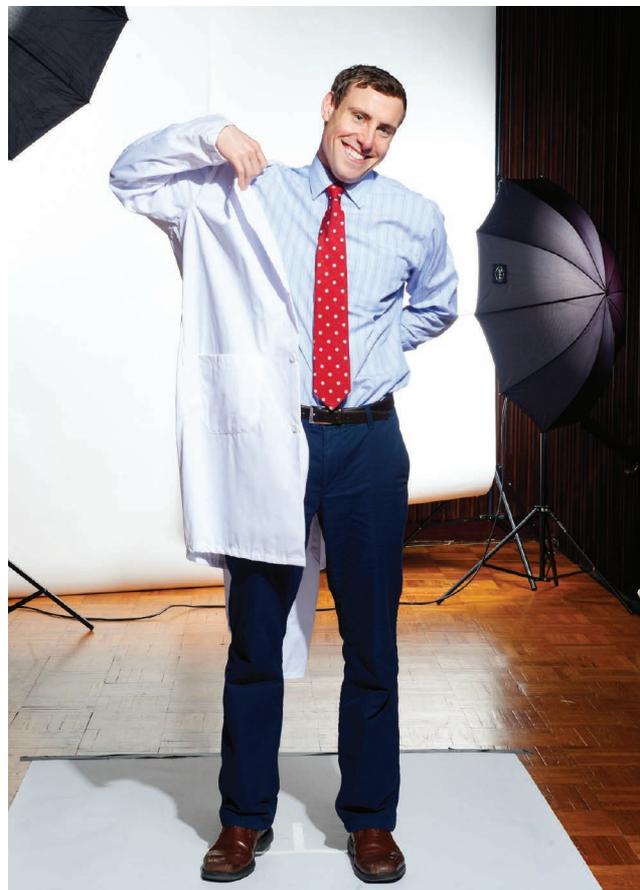


DAFNA BAR-SAGI, PHD, vice dean for science and chief scientific officer, has been elected to the board of directors of the American Association for Cancer

TRENDSETTERS IN WHITE COATS BEGIN RESIDENCIES

AMONG THE 177 freshly minted physicians in this year's graduating class are 15 trailblazing men and women. They are the first graduates of NYU School of Medicine's Accelerated Three-Year MD Pathway, which offers select students a medical degree in three years instead of four, with a guaranteed residency of their choice at NYU Langone. The School launched the program in 2013 to allow students to individualize their coursework, and enable those who are certain about their specialty to accelerate and integrate their undergraduate

and graduate medical education, all while reducing their debt burden. In fact, graduates can expect to save more than \$245,000 when factoring in tuition and housing for a fourth year of medical school, plus the cost of residency applications and potential earnings as a first-year physician. With funding from the Josiah Macy Jr. Foundation, NYU School of Medicine is spearheading a consortium among eight other medical schools to identify and share best practices for accelerated medical education nationwide. ■



▼ Devon Ryan, MD ('16), one of 15 inaugural graduates of the Accelerated Three-Year MD Pathway, is now a resident in orthopaedic surgery at NYU Langone.

School of Medicine's Research Ranking by U.S. News Rises to #11

OUT OF 140 medical schools nationwide, NYU School of Medicine was rated number 11 in the nation and number 2 in New York State for research in *U.S. News & World Report's* 2017 Best Graduate Schools rankings, the publication announced in March. The ranking represents a significant gain over last year, when the School was rated number 14 (breaking the top-15 for the first time), and a dramatic leap from 2007, the year Robert I. Grossman, MD, became dean and CEO of NYU Langone. That year, the School was ranked number 34.

"Our continued rise in the *U.S. News* rankings over the past 10 years represents one of the fastest increases in the history of the survey, reflecting the hard work and dedication of each and every member of our committed faculty and staff," said Dean Grossman.

U.S. News & World Report uses a range of statistical factors to evaluate a school's research enterprise, including assessments by deans and residency directors and research funding. ■



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MEDICINAL VIALS— OR TIME CAPSULES?

THIS YEAR MARKS two milestones in the history of NYU School of Medicine: its 175th anniversary and the opening of the Sidney and Ruth Lapidus Health Sciences Library. Named for an NYU Langone trustee and his wife, whose generous donation launched the oral history program and will expand digital collections of documents, photographs, and other archival materials, the library replaces the one destroyed by Hurricane Sandy. Among the hundreds of artifacts housed in its Lillian & Clarence de la

Chapelle Medical Archives are a doctor's bag that contained the medicinal vials shown here. The case, belonging to Frederick Seiberling, MD (1840–1921), was donated to NYU Langone in 1969. An alumnus of University Medical College, the forerunner of NYU School of Medicine, Dr. Seiberling was president of the County Medical Society in Lehigh, Pennsylvania. A selection of objects from the archives will be exhibited in a large, glass-encased wall cabinet that spans two floors in the new library. ■

