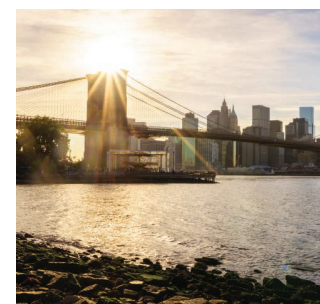


# NEWS & VIEWS

Where Patient Care,  
Scientific Research, and  
Medical Education Meet  
**MARCH/APRIL 2016**



Two years after being recruited by NYU Langone, Dr. Eduardo D. Rodriguez led a team that performed the most extensive face transplant to date.



## FOR MEDICAL CENTER, A NEW BROOKLYN BRIDGE

FORMAL MERGER BETWEEN NYU LANGONE AND NYU LUTHERAN ENHANCES HEALTHCARE IN ONE OF THE CITY'S MOST DIVERSE COMMUNITIES

**AT NYU LUTHERAN** Medical Center, they're calling it "the purple halo effect." Ever since the acute care teaching hospital in southwest Brooklyn joined the NYU Langone Medical Center family as an affiliate last spring, there's been a rise in patient volume. The most notable jump has been in the Emergency Department, where

## A Tale of Two Faces

SUPPORTED BY A TEAM OF MORE THAN 100 AT NYU LANGONE, DR. EDUARDO D. RODRIGUEZ PERFORMS THE MOST EXTENSIVE FACE TRANSPLANT IN HISTORY, TRANSFORMING THE LIFE OF A FORMER VOLUNTEER FIREFIGHTER.

**LAST NOVEMBER**, when NYU Langone Medical Center announced that a team of its surgeons had performed the most extensive face transplant in history—the only one performed on a first responder—the news made headlines around the world. Understandably, media attention focused on three people: the recipient, Patrick Hardison, a 41-year-old former volunteer firefighter from Senatobia, Mississippi, who

had suffered disfiguring burns during a rescue search in 2001; the donor, David Rodebaugh, a 26-year old Brooklyn bike mechanic, who had sustained fatal injuries in a bicycle accident; and renowned plastic surgeon Eduardo D. Rodriguez, MD, DDS, who led the effort to replace the skin and underlying tissue of Hardison's face, head, and neck. But in reality, the landmark surgery involved a team of more than 100 physicians, nurses, therapists,

and technical and support staff. "This was an incredibly complex undertaking," explains Dr. Rodriguez, the Helen L. Kimmel Professor of Reconstructive Plastic Surgery and chair of the Hansjörg Wyss Department of Plastic Surgery. "It took an extraordinary team to make it happen."

It also took more than a year of planning. The process began in late 2013, when Dr. Rodriguez was recruited by NYU Langone, in part, to launch

a face transplant program. The previous year, at the University of Maryland Medical Center, he had performed what was then the most successful and most complex face transplant ever attempted. At NYU Langone, Dr. Rodriguez began to assemble and train a team of experts from a wide range of disciplines, from plastic surgery and transplant medicine to psychology and

*CONTINUED ON PAGE 2*

### NYU Lutheran Annual Snapshot

**73,000**  
Emergency Room Visits

**4,000**  
Births

the number of patients has risen 6%. Now that the formal merger between NYU Langone and NYU Lutheran is official, as of January, the glow promises

*CONTINUED ON PAGE 3*

# The Most Extensive Face Transplant Yet

(CONTINUED FROM PAGE 1)

nursing. The following August, Hardison was selected as the program's first patient after undergoing rigorous physical and psychological evaluations. His face transplant is part of an ongoing research study, sponsored by NYU School of Medicine, to treat patients with severe facial injury and traumatic deformities. The fire that had destroyed his eyelids, lips, ears, most of his nose, and his entire scalp—plus 71 subsequent reconstructive surgeries—had left a mass of



Several years before the rescue mission that left him severely burned, volunteer firefighter Patrick Hardison plays with his daughter Alison.

scar tissue. Hardison was also in danger of losing his vision. Without eyelids, his corneas were unprotected; unable to blink, he could not moisten his eyes, making them vulnerable to infection. “When I heard Patrick’s story, I knew that I had to do all that I could to help him,” says Dr. Rodriguez.

To ensure that Hardison was prepared for the challenges of the surgery and its aftermath, Dr. Rodriguez, joined by a fellow surgeon, psychologist, social worker, and face transplant administrator, traveled to Senatobia, where they assessed the patient’s environment and met with his family, friends, fellow firemen, primary care physician, pharmacist, and pastor. Soon, Hardison was flying to New York each month

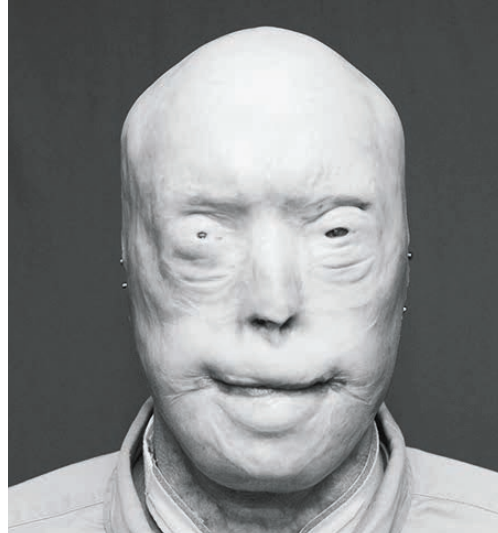
*“When I heard Patrick’s story, I knew that I had to do all that I could to help him,” says Dr. Rodriguez.*

for medical consultations and counseling. Dr. Rodriguez explained to him that there was a 50% chance he would not survive, and that he would require a lifetime of medications to prevent organ rejection. “There are things in life that are worse than dying,” said Hardison.

As the team prepared for the procedure, Leslie Bernstein, administrative director of the Hansjörg Wyss Department of Plastic Surgery and administrator of the Face Transplant Program, coordinated the behind-the-scenes logistics. A grant from NYU Langone would cover the first 90 days of treatment, and Mississippi Worker’s Compensation would then take over. Dr. Rodriguez and his surgical team performed numerous dry runs, using paired cadavers.

LiveOnNY, the organ recovery organization for the New York metropolitan area, identified Rodebaugh, who had been declared brain dead after his tragic accident, as an ideal match. His mother had made the heart-wrenching decision to donate his face and other organs. Rodebaugh was tall and fair, like Hardison, and according to his mother, he’d always dreamed of becoming a firefighter.

On the morning of August 14, 2015, the donor and recipient were wheeled into adjoining operating rooms at Tisch Hospital. Dr. Rodriguez and members of his surgical team spent the entire day preparing the donor’s face, meticulously identifying and preserving nerves and blood vessels. His heart, liver, and kidneys would later be



Patrick Hardison before his face transplant and six months after the landmark operation that gave him his life back.

## Milestones of the Landmark Surgery

Of the 37 documented face transplants performed to date, Patrick Hardison’s surgery at NYU Langone replaced the largest quantity of tissue. Other advances included:



### EYELIDS

Hardison’s transplant was the first to restore the ability to blink, saving him from near-certain blindness.



### EARS

Before the transplant, Hardison wore prosthetic ears, which muffled his hearing.



### BONES

Portions of the donor’s chin, cheekbones, and nasal bones were implanted to improve the fit of the donor’s face.



### SCALP

Hardison’s transplant was the first to transplant the entire hair-bearing scalp.



### GUIDES

Cutting guides were 3-D-printed from CT scans, enabling a precise match between the incisions made to donor and recipient

harvested for transplant in four other recipients.

That evening, using a novel technique to ensure a perfect fit, Dr. Rodriguez secured the donor’s face to Hardison’s. After suturing together the major nerves, veins, and arteries, surgeons connected the tiny muscles of the eyelids and the delicate mucosa of the nostrils and lips. The last stitch went in at 9:15 a.m. the next day—more than 26 hours after the surgery began.

Three days after the surgery, Hardison could blink. In the weeks that followed, as postoperative swelling subsided, therapists helped him learn to speak and swallow with his reconstructed mouth. For the first time in 14 years, he could go out in public without drawing stares. The father of five was home in time to enjoy Thanksgiving with his loved ones. He returns to

NYU Langone monthly for checkups. By January, he was regaining the ability to form facial expressions.

“I’m deeply grateful to my donor and his family,” says Hardison. “I hope they see in me the goodness of their decision. And I want to thank Dr. Rodriguez and his amazing team. They’ve given me more than a new face—they’ve given me a new life.” ■



## FORMAL MERGER BETWEEN NYU LUTHERAN AND NYU LANGONE STRENGTHENS BOTH PARTNERS

(CONTINUED FROM PAGE 1)

to get even brighter. “Our two organizations are now one, as we welcome some 5,000 physicians and staff members at NYU Lutheran into our family,” says Robert I. Grossman, MD, the Saul J. Farber Dean and CEO of NYU Langone. “This partnership represents the beginning of a historic new health-care delivery system that will enable us to provide even better care to more New Yorkers—and all of our patients—in more locations than ever before.”

NYU Langone has long enjoyed close ties with New York City’s most populous borough. Brooklyn residents account for more than 31% of NYU Langone’s hospital admissions and nearly 26% of its outpatient visits. Nearly half the babies born at Tisch Hospital go home to Brooklyn.

Brooklyn residents who currently travel to Manhattan for primary and specialty care can now benefit locally from early and more frequent interventions from NYU Lutheran specialists. Meanwhile, NYU Lutheran’s patients now have enhanced access to NYU Langone’s vast range of medical and surgical specialties—at its main campus in Manhattan and throughout its rapidly expanding network of ambulatory care centers—as well as access to research and clinical trials. In addition, work continues to fully integrate the entire network through Epic, a robust electronic health records system.

NYU Lutheran and the Brooklynites it serves will benefit from significant investments from NYU Langone. Key projects designed

At NYU Lutheran’s rehabilitation center, senior occupational therapist Heather Wesson trains Elvin Bynum, a stroke patient, to help him regain normal function of his arms.

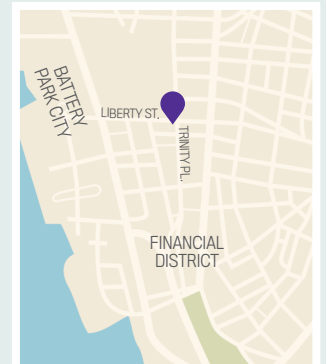
to enhance services, facilities, and access to care for patients include the renovation and modernization of the cardiac catheterization lab, and the creation of a state-of-the-art neonatal intensive care unit, a freestanding ambulatory surgical center, and an observation unit adjacent to NYU

Lutheran’s Emergency Department.

“NYU Langone recognized our potential to raise the bar even higher in seeking to provide world-class care on par with the very

*“Our two organizations are now one, as we welcome some 5,000 physicians and staff members at NYU Lutheran into our family,” says Robert I. Grossman, MD, the Saul J. Farber Dean and CEO of NYU Langone.*

best academic medical centers,” says Claudia C. Caine, president of NYU Lutheran. “We already serve patients from across the globe, and this partnership allows us to offer a wider range of services close to home for our richly diverse community.” ■



### NYU LANGONE’S FIRST URGENT CARE CENTER OPENS

LAST DECEMBER, NYU Langone marked another milestone in outpatient care: the debut of its first urgent care center, NYU Langone Medhatten Urgent Care. Located at Liberty Street and Trinity Place, the intimate, full-service practice is staffed by four board-certified physicians—three specialists in emergency medicine and one in family medicine—ensuring top-notch acute-care across all specialties.

“Our mission is to help patients navigate their acute medical problems,” says Leslie Miller, MD, the center’s medical director, who has served as an attending physician and administrator at some of the city’s finest emergency departments. “Patients are usually seen within 15 minutes and are on their way in less than an hour. They leave with a care plan, a follow-up appointment, and the assurance that we’re accessible for any questions.” Test results are provided, and critical prescriptions can be filled on-site.

“I’m proud to say that we’ve saved a number of lives in this practice, thanks to the skill and diagnostic acuity of our physicians,” says Dr. Miller. ■

FOR MORE INFORMATION ABOUT NYU LANGONE MEDHATTAN URGENT CARE, call 646-461-2544, or visit [nyulangone.org/medhatten](http://nyulangone.org/medhatten).

# Q&A

## PREETI RAGHAVAN, MD: CLINICIAN, INVENTOR, PROBLEM-SOLVER

*At NYU Langone's Rusk Rehabilitation, physiatrist Preeti Raghavan, MD, treats patients recovering from stroke and traumatic brain injuries, as well as those with neurological conditions such as multiple sclerosis and cerebral palsy. She's also director of the Motor Recovery Research Laboratory, which pioneers techniques to restore arm and hand function in patients with neurological damage. Dr. Raghavan's research is supported, in part, by Ilse Melamid and Carol Feinberg.*

Dr. Preeti Raghavan



### Why specialize in rehabilitation medicine?

As a girl, I was very close to my great-grandfather, an engineer who'd built one of the largest dams in India. In his 90s, he had a stroke, and what bothered him most was losing the use of his right hand. Later, when I was in medical school, researchers were just beginning to understand how the brain can rewire itself in response to experience, a phenomenon known as neuroplasticity. So I decided to specialize in neurorehabilitation, focusing on the connection between the brain and the upper extremities.

### You and your team invented the m2 Bimanual Arm Trainer, the first FDA-cleared device that uses a stroke patient's unaffected arm to retrain their weak or paralyzed counterpart. How did you come up with the idea?

A decade ago, physicians would immobilize a stroke patient's good arm, on the theory that this would force the affected arm to relearn motor skills. But in my clinical studies, I found that the affected arm learned a task much better when the good arm did it, too. In fact, the unaffected side could actually teach the affected side. This led my team to develop several devices in which the patient's arms, hands, or fingers are connected by cables. When the good side moves, the weakened side moves in the same way. Because the arm trainer was easy for even severely impaired patients to use, we made it a priority to get it patented and approved. At present, it's available only at Rusk Rehabilitation.

### How does the device work?

The patient places his or her arms on a pair of specially designed movable arm rests and performs a series of exercises. Initially, that was all there was to it. But when we began treating a five-year-old boy with attention deficit hyperactivity disorder, we added a customizable video-game component to increase engagement and motivation. Now, the patient rows on a virtual river, catches virtual objects, or cups virtual water in his hands, earning points for good performance. It's fun, and patients love being able to train on their own because it gives them a sense of control over their own body. Clinical trials are ongoing, but the device has been shown to improve shoulder rotation, forearm rotation, and wrist extension. Anecdotally, we've seen improvements in hand opening as well. After a few sessions, many patients find it easier to put on a coat, turn a doorknob, or hold a steering wheel. The exercise routine can be tailored to the patient's stage of recovery.

### How do you motivate your patients?

I try to empower them to take charge of their own recovery. Patients are often told that if they haven't recovered hand function within the first six months, they never will. But research shows that recovery can occur long after injury if people work at it. I tell patients that they're like elite athletes: they have to practice to keep on top of their game. ■

TO FIND A STROKE REHABILITATION SPECIALIST, call 855-698-7875, or visit [nyulangone.org/strokerehab](http://nyulangone.org/strokerehab).



## \$7.5 Million Grant Supports Services for Alzheimer's Caregivers in New York City

**NYULANGONE** has long been at the forefront of Alzheimer's research and care, and now an innovative new program is under way, thanks to a \$7.5 million grant from Governor Andrew M. Cuomo's Alzheimer's Caregiver Support Initiative. On April 1, NYU Langone will debut the Caregiver Integrated Support and Services Access Program (CISSAP), which will provide care consultation, family counseling, education, peer support, and more to maintain the emotional and physical well-being of Alzheimer's family caregivers.

Its goal is to address the emotional issues caregivers face, such as depression and stress, as well as physical ones, since many caregivers focus on their patient's health at the expense of their own. Following an assessment, participants will receive services tailored to their individual needs from a social service team that will have access to medical experts. The services can be provided in person, online, or by phone.

"People who enroll will be able to receive consultation and support from one team of social workers for the entire time they're caregivers, which is what makes this program unique," says Mary Mittelman, DrPH, principal investigator for CISSAP and a research professor of psychiatry and rehabilitation medicine at NYU Langone. "Help and support over the course of the disease is essential to caregiver well-being because Alzheimer's disease can last for many years, and the symptoms change over time, as do the needs of the caregiver."

The CISSAP investigators also include Thomas Wisniewski, MD, the Lulu P. and David J. Levidow Professor of Neurology, and Joshua Chodosh, MD, the Michael L. Freedman Professor of Geriatric Research.

The underlying principles of the program are embodied in the NYU Caregiver Intervention protocol, which proved effective in a randomized controlled study by Dr. Mittelman in helping people better cope with the challenges of caring for relatives with Alzheimer's. "Caregivers are often unrecognized and underserved," she says, "so this grant gives us the opportunity to provide them with the comprehensive care they need." ■

# NEW DIABETES PREVENTION PROGRAM TARGETS THOSE AT RISK

WITH A SIMPLE QUESTIONNAIRE, BLOOD TESTING, AND INDIVIDUAL COUNSELING FOR LIFESTYLE CHANGES, DOCTORS AIM TO NIP DIABETES IN THE BUD.



Dr. Michael Bergman, director of NYU Langone's new Diabetes Prevention Program, shown above with members of his team and below checking the blood sugar level of a patient, believes that prediabetes could be diagnosed much earlier if all health care providers—dentists, podiatrists, even pharmacists—routinely screened their patients.

**A CENTURY AGO**, Elliott Joslin, MD, one of the first physicians in the US to specialize in diabetes, noted that “real headway against the ravages of this disease begins with prevention rather than treatment.” Few people understand that better than endocrinologist Michael Bergman, MD, director of the new Diabetes Prevention Program at NYU Langone. Dr. Bergman has been treating and studying the disease for 35 years, has edited a comprehensive textbook on global diabetes prevention, and has spent several years searching for a biological marker to identify those at early risk for developing diabetes.

Last year, Dr. Bergman was tapped to head the new program, overseeing a team of endocrinologists, nutritionists, and diabetes educators. NYU Langone was nationally ranked in diabetes and



endocrinology on *U.S. News & World Report's* Best Hospitals 2015–16 Honor Roll.

In the US, an estimated 29 million adults have type-2 diabetes, in which the body doesn't make enough insulin to process sugar properly or can't use insulin because cells have become desensitized to it. An estimated 1.25 million children and adults have type-1

diabetes, in which the body does not make insulin due to the destruction of insulin-producing cells in the pancreas. The precursor to diabetes is called prediabetes—blood sugar levels are higher than normal but not high enough to be classified as diabetes. The Diabetes Prevention Program targets people in this group, which numbers an estimated 86 million adults (one in three), for early intervention. Diabetes and prediabetes are both diagnosed through blood tests.

Dr. Bergman stresses that the “pre” doesn't mean that the condition is benign. “I consider prediabetes a disease in its own right,” he says, “because it can result in similar complications—heart disease, stroke, and other associated disorders—but on a much smaller scale.” Without intervention, he adds, up to 30% of those with prediabetes will develop

diabetes within five years, and up to 70% will do so eventually.

Only 10% of those with prediabetes are diagnosed, and fewer still receive clear guidance about where to go and what to do to get help. The reasons, Dr. Bergman explains, are partly because the condition typically poses no symptoms and partly because many physicians are not on the lookout for it.

“Every time I see someone get the diagnosis of diabetes,” says Dr. Bergman, “I say to myself, ‘Did this have to happen?’ Prediabetes is a wake-up call. I see primary care physicians as the sweet spot because they can identify the problem early. The progression to full-blown diabetes can take a decade or even longer. That's a big window of opportunity for prevention.”

Dr. Bergman and his team support patients through challenging lifestyle changes and self-management by creating a flexible, personalized plan of action and expert counseling. The emphasis is on eating carefully, maintaining a healthy weight, exercising regularly, managing stress, and getting adequate



sleep. The screening process often begins with a simple questionnaire (see Prediabetes Screening Test at [nyulangone.org/diabetesprevention](http://nyulangone.org/diabetesprevention)) that may signal the need for a blood test to confirm a mounting blood sugar problem, followed by more specialized tests.

“With our aging, increasingly overweight population,” notes Steven Hodak, MD, associate director of the Division of Endocrinology, Diabetes, and Metabolism, “this is a critical time to identify people at risk and offer them relatively simple interventions that can avoid serious medical problems down the road.”

Studies show that in most cases, diabetes can be delayed or even prevented with lifestyle modifications. “If you're overweight, you can reduce your risk by 58% by losing 5 to 7% of your body weight and exercising moderately for a total of 150 minutes a week,” Dr. Bergman explains to patients to empower them. “That's considerably more effective than medication.”

*“Every time I see someone get the diagnosis of diabetes, I say to myself, ‘Did this have to happen?’”*

## Are you at risk for type-2 diabetes?

You should be screened for diabetes if you meet any of the following criteria:

- You have a family history of type-2 diabetes (sibling, parent, or grandparent).
- You're 65 or older (25% of those in this age group have diabetes and 51% have prediabetes).
- You're overweight.
- You have an inactive lifestyle.
- Your heritage is African-American, Hispanic, American Indian, or Asian-American, or you're a Pacific Islander.
- You developed gestational diabetes when you were pregnant.
- You have polycystic ovary syndrome, a condition characterized by irregular menstrual periods, excessive hair growth, and obesity. ■

TO FIND A DOCTOR WHO TREATS PREDIABETES, call 212-481-1350, or visit [nyulangone.org/diabetesprevention](http://nyulangone.org/diabetesprevention).

# Healthy Births

How risky is pregnancy for women with lupus? What are the origins of autism? How does a vaginal or cesarean birth impact a newborn's microbial flora? Three projects led by researchers at NYU Langone are posing big questions about health and disease during pregnancy and birth. For each, recent studies have cast new light on potential risks, protections, and future interventions.



## FOR MANY WOMEN WITH LUPUS, PREGNANCY IS SAFER THAN THOUGHT

THE LARGEST STUDY OF ITS KIND OVERTURNS COMMON ASSUMPTIONS ABOUT THE RISKS OF LUPUS DURING PREGNANCY, SHOWING THAT MOTHER AND BABY CAN THRIVE WITH THE RIGHT CLINICAL CARE.

**DOCTORS ONCE** cautioned any woman with lupus to think twice about getting pregnant, citing the health risks to mother and child. More recent studies suggested that women in remission from the autoimmune disease could have healthy pregnancies, but doubts persisted.

Now, the largest study of its kind, led by Jill Buyon, MD, the Lady Va and Sir Deryck Maughan Professor of Rheumatology and director of NYU Langone's renowned Division of Rheumatology and its Lupus Center, leaves no question that mother and baby can do well in most cases, provided lupus remains well controlled. "Other studies have come to similar conclusions," Dr. Buyon says, "but this is the largest multicenter prospective study ever done."

The study, published in the *Annals of Internal Medicine*, found that 81% of expectant moms with lupus delivered healthy, full-term babies. Of the 385 pregnant women who enrolled in the study, 35% were African American or Hispanic, a significant fraction given that minorities are at higher risk for the disease but often underrepresented in clinical trials.

Critically, Dr. Buyon says, "we identified factors that tell us who is likely to have a poor pregnancy outcome." In addition to ethnic or racial minority status, a woman's risk factors include active disease and flare-ups during pregnancy, the use of high blood pressure medication, a positive test for an antibody called lupus anticoagulant, and low blood platelet counts. "If the patients have none of these risk factors, they do almost as well as the general population," she says. ■

## A POTENTIAL AUTISM INTERVENTION THAT TARGETS THE WOMB

EXPERIMENTAL EVIDENCE IN EXPECTANT MICE LINKS INFLAMMATION TO AUTISM-LIKE BEHAVIORS IN THEIR OFFSPRING.

**SCIENTISTS AT** NYU Langone investigating the origins of autism have found that exposing pregnant mice to a virus-mimicking compound activates a specific immune response that results in mouse pups with autism-like behaviors. The study, published in the journal *Science*, also detected disruptions in a brain region previously linked to autism.

The activated immune cells, known as T helper cells, release a small protein called interleukin 17a that fights off infections but sometimes inadvertently promotes inflammation and autoimmune reactions. When the researchers blocked either the immune cells or the secreted proteins in infected mothers, their pups displayed normal behaviors and brain structures.

"This is indeed the first time a link has been made between specific immune cells and autism-like behaviors," says study co-author Dan Littman, MD, PhD, the Helen L. and Martin S. Kimmel Professor of Molecular Immunology.

"We monitored three cardinal behavioral changes often seen in autism," explains Dr. Littman. When compared to healthy pups, affected pups spent more time crying when separated from their mothers, had more trouble distinguishing

*"This is indeed the first time a link has been made between specific immune cells and autism-like behaviors," says study co-author Dan Littman, MD, PhD.*

between another mouse and a toy, suggesting altered social interactions, and were more likely to compulsively bury marbles in their cages.

Translating the findings to humans, Dr. Littman stresses, will require further study. Likewise, he says the therapeutic potential, although promising, will depend upon large clinical trials to identify any correlations between elevated numbers of T helper cells or interleukin 17a in a mother's womb and autism-like behaviors in her child. ■

## BACTERIAL BOOST FOR C-SECTION BABIES

NYU LANGONE STUDY SHOWCASES INNOVATIVE METHOD TO REPLACE BIRTH-CANAL BACTERIA MISSING FROM BABIES BORN VIA CESAREAN.

**AS BABIES** squeeze through the birth canal they encounter several kinds of naturally occurring vaginal bacteria that babies born by cesarean do not. The long-term health implications of these missing microbes are still unknown, however research suggests that babies born surgically are more prone to allergies and autoimmune disorders as adults. Maria Gloria Dominguez-Bello, PhD, associate professor of medicine at NYU Langone, is among a growing chorus of researchers who believe that bacteria in the birth canal play a role in helping babies form healthy immune systems, and she's developed an innovative method to help cesarean babies acquire a similar bacterial mix as vaginally born babies.

In a small proof-of-principle study published in *Nature Medicine*—the first glimpse of a larger effort in the works at NYU Langone—Dr. Dominguez-Bello and colleagues described how they partially restored vaginal microbes to four babies born via cesarean. At a collaborating hospital in Puerto Rico, doctors swabbed each newborn with the mother's vaginal fluids. One month later, the bacteria profile on the infants' skin more closely resembled those of vaginally delivered babies than of untreated C-section babies.

"Our results establish feasibility but not health outcomes," cautions Dr. Dominguez-Bello. The next step is a larger clinical study to gauge the benefits of transferring vaginal microbes after a C-section birth. ■

FOR MORE INFORMATION ABOUT THE ONGOING CLINICAL TRIAL, contact Nora Henderson at [Nora.Henderson@nyumc.org](mailto:Nora.Henderson@nyumc.org).

# THE TRUTH ABOUT CHILDHOOD VACCINES

LEADING PEDIATRICIANS CHALLENGE MISINFORMATION ABOUT VACCINE SAFETY THAT HAS FUELED A RESURGENCE OF PREVENTABLE DISEASES.

IN RECENT YEARS, measles outbreaks in Pennsylvania and California sickened some 500 mostly unvaccinated men, women, and children—reminders that once-common childhood infectious diseases still threaten us. Some parents believe, however, that routine childhood vaccines are fraught with serious risks that outweigh their benefits. News & Views interviewed three leading pediatricians at NYU Langone Medical Center, each with expertise in vaccines, to help sort out the facts from the fallacies.

## **Vaccines cause autism.**

**FALSE** “Hundreds of studies have looked at this issue and not a single one has found a link between vaccines and autism,” notes pediatrician Benard Dreyer, MD, who also serves as president of the American Academy of Pediatrics. The one study that raised this possibility was found to have been based on falsified data and has since been retracted. Adding to the confusion, symptoms of autism tend to arise around the same time children get several of their vaccines. “But just because these two events occur simultaneously doesn’t mean there’s a correlation, and the science shows there isn’t,” says William Borkowsky, MD, director of the Division of Pediatric Infectious Diseases.

## **It’s ok to change a child’s immunization schedule to avoid overwhelming his or her immune system with too many vaccines.**

**FALSE** Multiple vaccines do not overwhelm a child’s developing immune system, notes Dr. Borkowsky. The timing of each vaccine is

based on when the immune system will generate the best response, which is balanced with the need to provide protection at the earliest possible age. Altering that carefully designed schedule—or the vaccine dosage—could compromise a child’s ability to fight off disease, though exceptions may be made.

## **Vaccine additives are dangerous.**

**FALSE** A variety of ingredients are used to stabilize vaccines or enhance their effectiveness, and studies show that none of these additives poses any health risks. “All vaccines go through years of rigorous safety testing before they are brought to market,” explains pediatrician Arthur Fierman, MD, director of the Division of General Pediatrics.

## **Since most childhood diseases are now rare, vaccines are no longer necessary.**

**FALSE** Thanks to vaccines, diseases like mumps and whooping cough have largely disappeared. But the viruses and bacteria that cause them have not. “The only infectious agent that we’ve ever exterminated is smallpox,” notes Dr. Borkowsky. “If we don’t continue to vaccinate children, the other diseases will return in epidemic proportions.”

## **If most children get vaccinated, the ones who are not immunized will be protected.**

**TRUE** This phenomenon is known as herd immunity. “But once vaccination rates dip below 80% for healthy people and 90% for high-risk people, herd immunity no longer works,” explains Dr. Borkow-

sky. The appearance of just one case in an under-vaccinated community can cause that disease to spread. The experts note that vaccines are not 100% effective and having a communicable disease in childhood does not necessarily confer life-long immunity.

## **Some vaccines are dangerous for children whose immune systems are compromised.**

**TRUE** A few vaccines may pose harm to children with severe immune disorders. But there’s no blanket recommendation for whether

immunocompromised children should or shouldn’t be vaccinated. “In the case of immune disorders, the safety and efficacy of vaccinations depends on the nature of the disorder, as well as the vaccine in question,” explains Dr. Fierman. “Parents who have any concerns should consult their pediatrician,” he says. “Learn as much as possible, but use your pediatrician as an interpreter.” ■



# A NEW LOOK ON LIFE

FACING TOTAL BLINDNESS, ANNA MROZ THOUGHT SHE'D NEVER SET EYES UPON HER NEW GRANDSON. THEN A BOLD SURGICAL INTERVENTION CHANGED EVERYTHING.



To operate on tumors at the base of the skull, Dr. Chandra Sen uses a surgical microscope.

PHOTOS: JOSHUA BRIGHT. (FACING PAGE) COURTESY OF THE MROZ FAMILY



*Of all the hardships Anna Mroz has faced in her 68 years—caring for a mother with epilepsy; fleeing communist Poland as a political refugee in 1985; adjusting to life in New York City without speaking English—none threatened her world as profoundly as the prospect of going blind.*

Several surgeries had failed to repair a detached retina, leaving her blind in her right eye. Then, by last winter, the vision in her other eye had faded so much that Mroz found herself bumping into the walls of her apartment and people on the street. She saw shadows instead of faces.

Mroz feared losing her apartment and her independence, becoming a burden to her children, and not being able to see her newborn grandson. “I know what it’s like to see darkness out of an eye,” says Mroz. “To have that in the other eye, I just can’t imagine anything worse.”

Initially, an ophthalmologist near her home on Ocean Parkway in Brooklyn diagnosed her problem as a cataract. But when cataract surgery failed to make a lasting improvement, and then a retina specialist couldn’t help, she was referred in March 2015 to Mohammad Fouladvand, MD, a neuro-ophthalmologist at NYU Langone who specializes in treating neurological and systemic disorders that affect vision. From the abnormal shape and color of her optic nerve, Dr. Fouladvand suspected the problem was not in her eye, but her brain. He immediately ordered an MRI. “You have no time to lose with these cases,” he explains. “Once the vision is gone, it cannot be recovered.”

The scan bore out Dr. Fouladvand’s suspicions. Mroz had a benign schwannoma, a rare tumor that affects only a few thousand people in the US each year. The growth was compressing the optic nerve and would eventually cause Mroz to become totally blind. Dr. Fouladvand referred her to Chandra Sen, MD, director of the Division of Skull-Base Surgery in NYU Langone’s Department of Neurosurgery (see *A Master Surgeon Among Many*). A pioneering surgeon sought out for his expertise on skull-base tumors (he operates on 40 to 50 each year), he recommended immediate surgery to remove the tumor and preserve her existing vision.

But the stakes were high. Operations on deep-seated tumors like Mroz’s are considered high-risk because such masses are difficult to reach and often involve critical structures, such as the brain stem, cranial nerves, and blood vessels that feed important parts of the brain. Injuring any of these can result in stroke, paralysis, blindness, hearing loss, facial paralysis, loss of voice, or other problems. Mroz’s case was especially risky because she had vision in only one eye, and her optic nerve was in bad shape. “I could do the operation, and Ms. Mroz could wake

up totally blind,” says Dr. Sen. “I told her that the most reasonable expectation would be to prevent further deterioration of her vision. If her vision were to get better, that would be a bonus.” To Mroz, any chance of seeing her grandson, then just two weeks old, seemed better than none. “Dr. Sen said, ‘I will do my best,’” she recalls, “‘but there is no guarantee this will help.’ I told him, ‘I can’t live like I’m living now.’”

Mroz underwent surgery on April 2 last year. Dr. Sen first removed pieces of Mroz’s skull and eye socket. Relying on a surgical microscope, skilled hands, and nearly 30 years of experience in the region where the brain and eye intersect, he moved cautiously amid a dense tangle of nerves, fat, and muscles. Dr. Sen took great care to avoid the nerves that control vision and eye and lid movement—all crucial for sight—as he painstakingly removed a tumor slightly larger than a hazelnut over the course of five hours.

When Mroz opened her eyes in the post anesthesia care unit, she could see clearly. In the weeks that followed, her vision improved so rapidly and completely that it surprised even Dr. Fouladvand, who rarely expects much from a damaged optic nerve. “Nobody thought she’d have more than partial vision,” he says.

Ultimately, however, Mroz’s field of vision expanded from 25% of its normal range to 100%, and her eyesight improved from 20/200 to 20/20. She no longer needs eyeglasses to read the morning paper. “I feel amazing,” she beams. Best of all, she says, she can see her grandson’s blue eyes.



Anna Mroz, with her grandson, Aiden, six months after her sight-saving surgery.

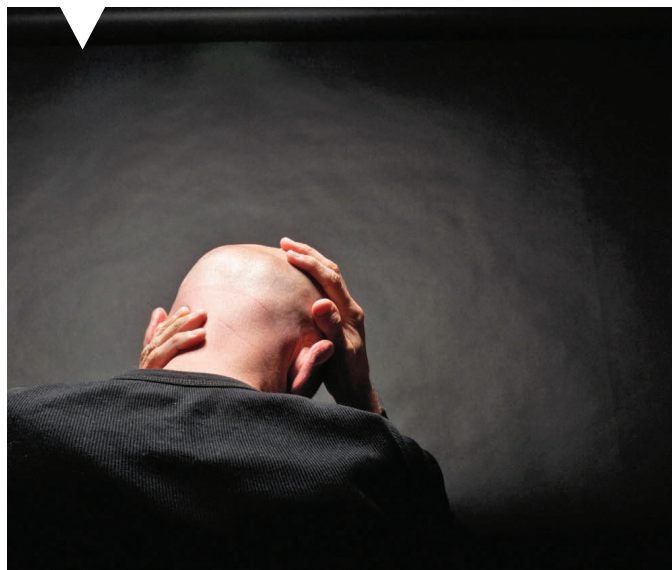
## A MASTER SURGEON AMONG MANY

**DR. CHANDRA SEN** is one of some 20 master neurosurgeons in NYU Langone’s Department of Neurosurgery who treat patients at Tisch Hospital, Bellevue Hospital Center, and the Manhattan campus of the VA NY Harbor Healthcare System. The internationally renowned department was founded in 1951 by Thomas Hoen, MD, who trained under Harvey Cushing, MD, the father of modern neurosurgery. The department’s expertise extends to brain tumors, brain aneurysms and vascular malformations, spine ailments, epileptic seizures, Parkinson’s disease, and a range of other conditions. For the past four years, *U.S. News & World Report’s* Best Hospitals Rankings has placed NYU Langone’s programs in neurology and neurosurgery among the top 10 in the country. “Our goal,” says John Golfinos, MD, chair of Neurosurgery, “is to be the place that other neurosurgery centers refer their most complex cases to because we can get the job done.” ■



# When Shedding Outpaces Growth

Most men and half of women experience hair loss, but it isn't inevitable. If caught early, it can often be slowed or even reversed.



**MORE THAN 80%** of men and nearly half of women experience significant hair loss during their lifetime. For many, the thinning starts well before middle age. Dermatologist Jerry Shapiro, MD, an internationally renowned expert and leading researcher on hair loss in the Ronald O. Perleman Department of Dermatology at NYU Langone, discusses the causes and treatment of this surprisingly complex problem.

## It's not just an age thing.

A typical scalp bears some 100,000 to 150,000 hairs. Normally, between 50 and 100 of them fall out daily as they complete their growth cycle. "When shedding outpaces growth," explains Dr. Shapiro, "the result is alopecia," the medical term for hair loss. The most common type in both men and women occurs when follicles become overly sensitive to a hormone and deteriorate. As a result, the growth phase shortens until it finally stops. Although alopecia becomes more prevalent with advancing years, it affects one in four men by age 30.

## Hair Today, Gone Tomorrow

**80%**  
of men experience significant hair loss.

**50%**  
of women experience significant hair loss.



Fifty to 100 hairs fall out daily as they complete their growth cycle.

## Physical and emotional stresses can play a role.

Alopecia causes 95% of cases of hair loss in men, and about 40% in women. But hair loss can have many other causes. Some people suffer from an autoimmune disorder that causes scattered bald patches. Shedding can also be triggered by unusual stress. "I call it the three Bs: bereavement, bankruptcy, or a breakup," says Dr. Shapiro. Other culprits include

chemotherapy, pregnancy, menopause, anabolic steroids, cigarette smoking, high doses of vitamin A, and some prescription medications. Compulsive hair pulling or tight ponytails can do it, too. "See a doctor if you notice abundant hair where you wouldn't normally see much, such as on your pillow," Dr. Shapiro advises.

## Diagnosis may require some sleuthing.

Diagnosis begins with a detailed patient history, possible triggering events, and a list of relatives with hair loss. Next comes an examination of the scalp. A dermatologist may perform a hair pull to see how many strands break off, or use a device to inspect hairs microscopically without removing them. The doctor may also order blood tests and check the patient for skin disorders or signs of hormonal problems (such as excess facial hair in women).

## Treatment options include medication and surgery.

If shedding is caused by illness, hair often grows back once the underlying problem is resolved. For male-pattern hair loss, there are two FDA-approved medications; for female-pattern hair loss, there's only one. The most effective—and only permanent—treatment, however, is a hair transplant: a dermatologist harvests healthy follicles from areas of dense growth and implants them where they're needed. NYU Langone's Hansjörg Wyss Department of Plastic Surgery offers an approach that is less invasive, extracting follicles with air pressure and suction rather than incisions. Says Dr. Shapiro: "The results can be dramatic." ■

TO FIND A DOCTOR WHO TREATS HAIR LOSS, call 888-769-8633, or visit [nyulangone.org/doctors](http://nyulangone.org/doctors).

# Concussion? There's an app for that.

FOR THE MILLIONS of patients in the US diagnosed with a concussion every year, the prevailing treatment has traditionally been rest. Yet that remedy may not be right for everyone. "Recent studies suggest that for some individuals, aerobic activity can be therapeutic," explains Dennis Cardone, DO, co-director of NYU Langone's Concussion Center, whose multidisciplinary team offers the latest evidence-based diagnostics and therapies for head injuries. But which patients are likely to benefit from exercise remains unknown. Another mystery is why symptoms—including headaches, dizziness, and mood swings—persist for longer than a month in up to 20% of cases.

Now Dr. Cardone and his colleagues at NYU Langone are turning to mobile technology to help find the answers. In December, the team launched a new app, called the NYU Langone Concussion Tracker, as part of a first-of-its-kind clinical trial in which patients diagnosed with a concussion log their symptoms as well as their performance on physical and mental tasks over the course of six weeks. Traditionally, physicians track such data only at follow-up appointments, which are too infrequent to provide a precise picture of the variables responsible for differences in recovery.

The new app, jointly developed by the Mobile App Solutions Team in the Medical Center's IT Department, under the direction of Nader Mherabi, NYU Langone's chief information officer, and by clinicians at the Concussion Center empowers patients with a data-driven view of their recovery while allowing researchers to recruit large numbers of volunteers and collect real-time data over extended periods.

Concussion Tracker can be used by any concussion patient in the US with an iPhone, and can be paired with an Apple Watch to collect additional data. Each day, patients complete a brief survey of symptoms, a concentration evaluation, and a six-minute walk test. All data is stripped of identifying details and transmitted to a server at NYU Langone that is accessible only to its researchers.

Enrollment is expected to reach several thousand over the course of the year-long study. "We can analyze results by age, gender, and other factors, and see whether different types of patients do better based upon their activity level and trends in their symptoms," says Paul Testa, MD, NYU Langone's chief medical information officer and one of the study's lead investigators. "You can't get this kind of valuable information without this technology." ■

TO FIND A DOCTOR WHO TREATS CONCUSSIONS, call 855-698-2220, or visit [nyulangone.org/concussioncenter](http://nyulangone.org/concussioncenter).

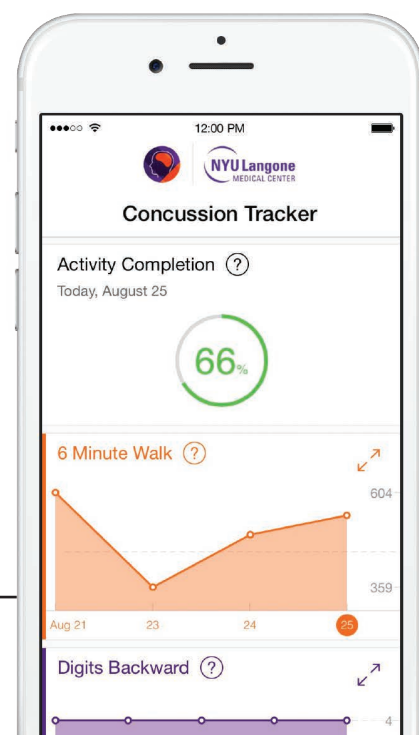


PHOTO: GARY JOHN NORMAN / GETTY IMAGES; (FACING PAGE) JAY BRADY

# APPOINTMENTS

NEW LEADERS ARE NAMED FOR THE DEPARTMENTS OF BIOCHEMISTRY AND MOLECULAR PHARMACOLOGY, OPHTHALMOLOGY, RADIATION ONCOLOGY, AND THE NEW TRANSPLANT INSTITUTE.



Michele Pagano, MD



Joel Schuman, MD



Alec Kimmelman, MD, PhD



Robert Montgomery, MD, DPhil

**MICHELE PAGANO, MD**, the May Ellen and Gerald Jay Ritter Professor of Oncology, was appointed chair of NYU Langone's Department of Biochemistry and Molecular Pharmacology. Dr. Pagano is an expert on the cellular recycling of proteins, known as the ubiquitin system. His identification of F-box proteins, which label waste within cells for recycling, opens a window onto cellular growth, proliferation, and DNA repair, and helps explain how defects in the cell's waste-removal processes lead to disease. One F-box protein, for example, may provide a key to treating certain aggressive cancers. Dr. Pagano joined NYU Langone in 1996 and has served as director of the Growth Control Program at the Laura and Isaac Perlmutter Cancer Center since 2000. He has received many prestigious grants, including a MERIT Award from the National Cancer Institute, and in 2008, he was appointed a Howard Hughes Medical Institute investigator.

**JOEL SCHUMAN, MD**, was appointed chair of NYU Langone's Department of Ophthalmology. Dr. Schuman's pioneering research has led to advances in the detection and treatment of glaucoma, a disease that can result in irreversible vision loss. He joins NYU Langone following a distinguished career at

the University of Pittsburgh School of Medicine, where he was chair of Ophthalmology, and director of the University of Pittsburgh Medical Center Eye Center. Dr. Schuman also held appointments at the university's McGowan Institute for Regenerative Medicine, the Center for the Neural Basis of Cognition, and as professor of bioengineering at the Swanson School of Engineering. A National Institutes of Health (NIH)-funded researcher, Dr. Schuman and his colleagues were the first to discover a molecular marker for glaucoma, which often causes no symptoms in its beginning stages.

**ALEC KIMMELMAN, MD, PHD**, was appointed chair of NYU Langone's Department of Radiation Oncology. Dr. Kimmelman joins the Perlmutter Cancer Center following a distinguished term as associate professor in the Departments of Radiation Oncology at Harvard Medical School and its major teaching affiliates, the Dana-Farber Cancer Institute and Brigham and Women's Hospital. His laboratory has made seminal contributions to the biological underpinnings of pancreatic cancer, the fourth leading cause of cancer death in the US. Dr. Kimmelman is also a practicing radiation oncologist specializing in the treatment of gastrointestinal cancers. His research on pancreatic cancer and autophagy, a cellular process

in which stressed cells cannibalize themselves for survival, has led to several promising clinical trials. A longtime NIH-funded investigator, Dr. Kimmelman was recently inducted into the American Society for Clinical Investigation.

**ROBERT MONTGOMERY, MD, DPHIL**, whose groundbreaking work in kidney transplantation includes laparoscopic innovations, was appointed director of NYU Langone's newly created Transplant Institute. Previously, he served as chief of the Division of Transplantation at The Johns Hopkins Hospital, where he was director of the Comprehensive Transplant Center and the Incompatible Kidney Transplant Program. There he helped to develop laparoscopic procurement of a live kidney donation through small incisions in the abdomen, now a standard practice for kidney donation worldwide. His team also accomplished many other firsts, including multiway donor exchanges, or domino exchanges. These occur when a living kidney donor who is not compatible with a particular recipient donates a kidney to another recipient, and that recipient's original, incompatible donor provides a kidney to another patient. This enables two recipients to receive healthy kidneys, where no transplants were possible before. ■

## Musculoskeletal Ball



**NYU LANGONE** hosted its annual Musculoskeletal Ball at the American Museum of Natural History in November, raising more than \$1.5 million for orthopaedics, rehabilitation medicine, and rheumatology. The event honored pioneering orthopaedic surgeon Roy Davidovitch, MD (third from left), and one of his patients, philanthropist Julia Koch (second from left). Attendees included Kenneth G. Langone, chairman, Board of Trustees (far right), and Joseph Zuckerman, MD, the Walter A. L. Thompson Professor of Orthopaedic Surgery and chair of the Department of Orthopaedic Surgery (far left). ■

## Perlmutter Cancer Center Gala



**NYU LANGONE** raised over \$1.6 million for the Laura and Isaac Perlmutter Cancer Center in October. Some 450 guests gathered at The Plaza Hotel to honor H. Leon Pachter, MD, the George David Stewart Professor of Surgery and chair of Surgery (second from left), shown with Kenneth G. Langone, chairman, Board of Trustees (far left); Lori Fink, Medical Center trustee and chair of the Perlmutter Cancer Center Advisory Board (third from left); and Robert I. Grossman, MD, the Saul J. Farber Dean and CEO of NYU Langone (far right), who announced that some of Dr. Pachter's grateful patients had made contributions to endow a professorship in his name. ■

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## The Big Picture

# ROOTS OF DIZZINESS

AS AN INTEGRATED academic medical center, we don't just treat conditions—we look for their origins, often in unexpected places. Take dizziness, one of the most common reasons people seek out medical help. Vertigo, or the false sensation that you are spinning, can result from something as benign as standing up too abruptly or from something much more serious, such as a tumor or stroke. The multitude of possibilities can make it challenging to arrive at a correct diagnosis.

To gain a better understanding of how the brain keeps us balanced and what goes wrong when it doesn't, David Schoppik, PhD, assistant professor of otolaryngology,

and neuroscience and physiology, studies the brain structure of the diminutive tropical zebrafish, seen here beneath a fluorescent microscope. The zebrafish uses a neural architecture remarkably similar to ours to maintain balance—just one reason it's among the most studied organisms in science.

In one recent study, Dr. Schoppik and his team measured the ability of larval zebrafish to stabilize their gaze following body rotations, and identified the neurons responsible for this important reflex. "Our goal," he says, "is to leverage the simplicity and molecular control of the fish model to understand and ultimately treat disease." ■

Fluorescence reveals the eyes and surrounding muscles of a zebrafish.

