

on
CENTER

ology and osurgery

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PATIENT VOLUME

4,790
neurosurgical
procedures
performed

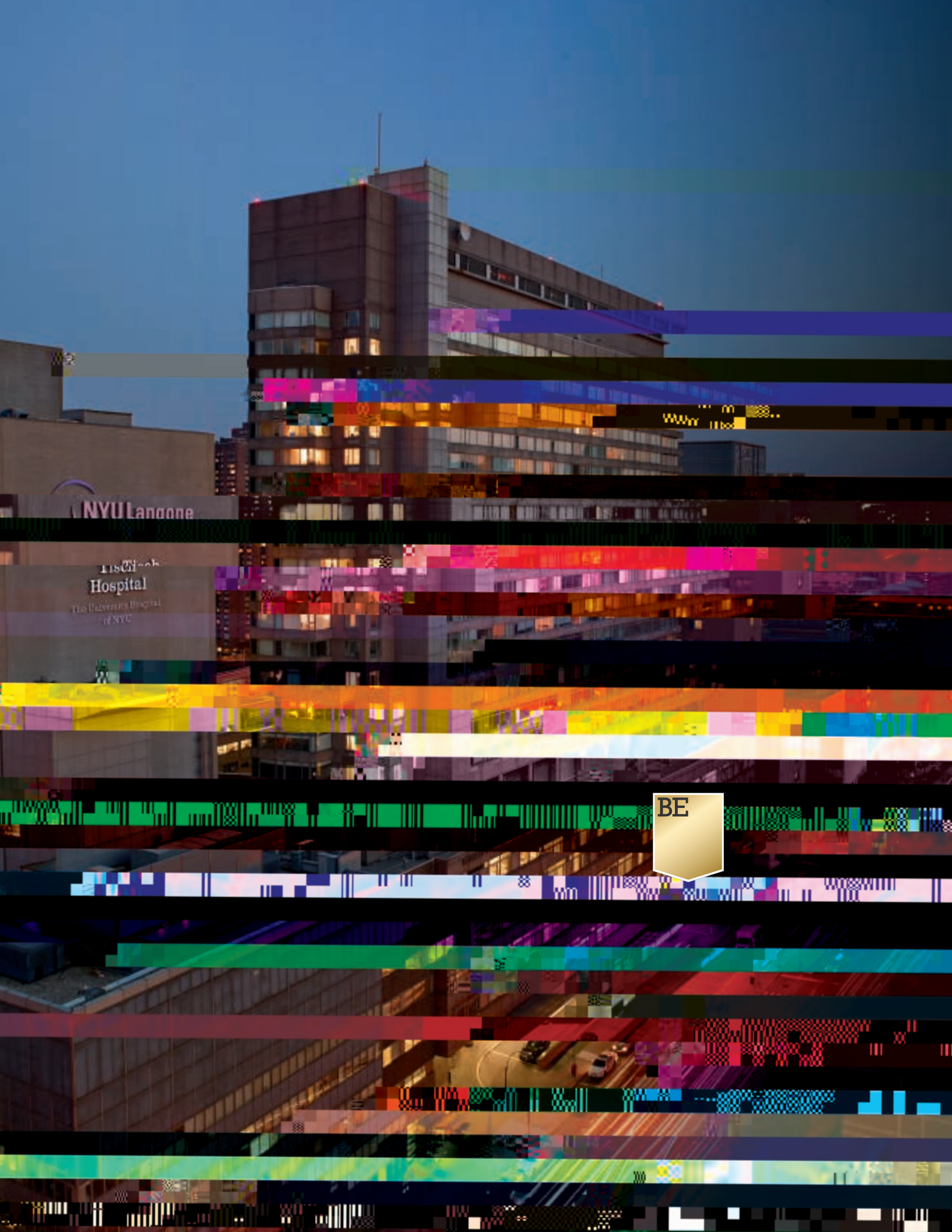
Doubled
surgical
case volume
in past ve years

50,000+
Neurology
patient visits

6% increase
compared to the prior year

Top 5
in Gamma Knife
patient volume
in the U.S.

PHYSICIANS



NYU Langone

11101
Hospital
The University Hospital
of NYU

BE

Laura J. Balcer, MD, Named Winner of
2015 Barancik Prize for MS Research

Research News

NEUROSURGERY RESEARCH LABS REPORT FINDINGS ON TUMOR GROWTH AND BRAIN ACTIVITY

Key findings published in 2015 from the NYU Langone Department of Neurosurgery basic research labs produced key insights that may fuel new therapeutic approaches.

→ A Journal of Neuroscience paper from the lab of Mitchell Chesler, MD, PhD, professor of neurosurgery and neuroscience & physiology, reported on ex-vivo mouse studies showing that the postsynaptic NMDA receptor current in hippocampal pyramidal cells is boosted in an autocrine fashion by a perisynaptic rise in surface pH. The extracellular alkaline shift was shown to be generated by the plasma membrane Ca²⁺-ATPase (PMCA) of the same cell generating the NMDA receptor current. This indicated that modulation of NMDA receptor responses via pH does not require massive synchronous neural discharge. Rather, it occurs normally at the level of single neurons and single synapses. These results may provide a means of regulating NMDA receptor responses by targeting

NYU LANGONE MEDICAL CENTER NEWS

Groundbreaking Face Transplant Exemplifies Expertise and Multidisciplinary Collaboration

In August 2015, surgeons at NYU Langone Medical Center performed the most complex face transplant to date. The patient, former firefighter Patrick Hardison, had lost all of the skin around his entire face, scalp and neck, including his eyelids, ears, lips, and nose, while trapped in a burning building. Led by Eduardo Rodriguez, MD, Helen L. Kimmel Professor of Reconstructive Plastic Surgery and chair of the Hansjörg Wyss Department of Surgery, the successful 26-hour operation—the first to include transplantation of eyelids capable of blinking and functional ears, among other milestones—involved more than 100 physicians, nurses, and technical and support staff.

Awards and Honors

- Jori Fleisher, MD, was appointed to the American Academy of Neurology Government Relations Committee, and to the American Academy of Neurology Meeting Management Committee.
- Farng-Yang A. Foo, MD, was presented with the “Doctor of the Year 2014” award by the National American Taiwanese Medical Association.
- Jacqueline A. French, MD, was appointed Chief Scientific Officer of the Epilepsy Foundation.
- John G. Golinos, MD, was honored at the 2014 Perlmutter Cancer Center Gala, and was the winner of the Wholeness of Life Award.
- David H. Harter, MD, was named an executive board member of the pediatric section of the American Association of Neurological Surgeons (AANS)/CNS.
-

Advanced Technologies Enhance Ability to Look Inside the Brain

3D MODELS GUIDING SURGICAL APPROACHES

"The brain tumor was lodged here," says Donato R. Pacione, MD, assistant professor of neurosurgery. As he speaks, he

NEW MRI TECHNOLOGY DEVELOPED AT NYU LANGONE



With Launch of New Fresco Inrth Law F2ar D13.3 (r0In)46 -6.0.6 (17.2.6c



TEAM APPROACH PRESERVES HEARING
WHILE REMOVING COUSTICUMOR

Age-Related Dementia: Moving Beyond Symptomatic Therapy

NYU LANGONE RESEARCHERS ARE DEVELOPING

In late 2015, the drug completed a two-year trial in squirrel monkeys, a species naturally prone to Alzheimer's disease. "Preliminary evidence from that study shows significant cognitive improvement and no apparent toxicity," Dr. Wisniewski says. One reason to be hopeful that the drug will be safe as well as effective, he adds, is that it is already being used in humans as an adjuvant treatment for cancer and hepatitis.

A second dementia therapy now in development at the CCN involves an NYU Langone-patented class of conformational monoclonal antibodies. A team led by Dr. Wisniewski and Fernando Goni, PhD, adjunct associate professor of neurology, presented promising data on this new treatment approach at the 2015 Alzheimer's Association International Conference.

The novel antibodies recognize the common structure of toxic oligomers produced by a variety of similarly misshapen neurodegenerative proteins, meaning that they could be effective against several brain disorders. "These antibodies recognize not only amyloid beta and tau oligomers, but also the oligomers associated with frontal temporal dementia, Parkinson's disease, and prion disease," Dr. Wisniewski says. "We're on the cusp of testing these agents clinically and hope to launch trials in the near future."

NOVEL VACCINE FENDS OFF PRION DISEASE

In 2015, Dr. Wisniewski's lab also published groundbreaking research confirming the efficacy of the first-ever vaccine for chronic wasting disease (CWD), a neurodegenerative disease that affects wild deer and elk.

CWD is spreading rapidly among wild deer herds in the U.S. The CCN's oral vaccine uses attenuated salmonella bacteria to which a prion-like protein has been attached. This stimulates production of prion antibodies in the animal's digestive tract. The antibodies then attack CWD prions once they're ingested.

NEW TOOLS AID DETECTION AND ANALYSIS OF ALZHEIMER'S

NYU Langone researchers are also developing techniques that allow earlier diagnosis of Alzheimer's and other dementias. One technique uses patented novel ligands that enhance the ability of PET scans to detect early evidence of brain toxin buildup. "Alzheimer's-related brain changes are known to begin 10 to 20 years before symptoms of dementia appear," Dr. Wisniewski notes.

The center also recently published a paper in *Scientific Reports* describing positive results from a new method of conducting proteomics on individual neuronal populations within small amounts of formalin-fixed, paraffin-embedded archival brain tissue. This novel approach, which uses laser capture microdissection, is expected to yield new information about Alzheimer's pathology and treatment targets.

"Because the new drugs now under investigation work synergistically, we could eventually have a menu of treatments for Alzheimer's disease," Dr. Wisniewski says.

"The ultimate goal is to combine these medications with early detection, and stop dementia from progressing before it can cause significant neural damage," he says.

"With the various novel approaches that are in development for both early detection and potential disease modification, I think there is reason to be optimistic about the future of Alzheimer's treatment."

Using Stereotactic Imaging to Navigate the Spine

New Spine Center Links Neurosurgical and Orthopaedic Services

In late 2015, the spinal neurosurgery division participated in the official launch of NYU Langone's new comprehensive Spine Center, a formalization of a longtime collaboration with spine specialists in the Medical Center's nationally ranked Orthopaedic Surgery Department. The center, co-directed by Dr. Frempong-Boadu and Thomas J. Errico, MD, professor of orthopaedic surgery and neurosurgery, leverages the skills of both

On the Clock: A Medical Center-Wide Push to Streamline Stroke Care

WITH COORDINATED CARE, A 73 PERCENT REDUCTION
IN STROKE MORTALITY

When NYU Langone was ranked number one by the University HealthSystem Consortium (UHC) in 2015 for overall patient safety and quality, one statistic stood out: The Medical Center's already low stroke mortality rate dropped a stunning 73 percent from 2013 to 2014, with a best-in-the-U.S. stroke mortality index score for the year's final quarter. Even more impressive, this occurred amid

UNIFORM CARE, AROUND THE CLOCK

The stroke service is also ensuring that the same high standard of care applies at any hour of the day or night, with uniform teams of skilled stroke clinicians on-site 24/7 at Tisch Hospital. “Strokes can happen any time,” says Dr. Ishida. “If a patient arrives here at three o’clock on a Sunday morning and needs emergency tPA or a clot-removing procedure, they’ll get exactly the same skilled care they’d get on a Tuesday afternoon.”

To further standardize care, the stroke service developed more than 30 specific stroke protocols during the past year—from dealing with an intracerebral

hemorrhage to properly managing hypertension in stroke patients—and intensively trained the entire Tisch Hospital staff on their individual roles in implementing them. While putting these standards into place was a labor-intensive process, notes Dr. Ishida, it’s paying off in improved patient outcomes.

“Good stroke care depends on making sure everyone in the hospital—not only who is on call—is aware of what our processes are,” she says. “We significantly improved

Combining Genetics and Novel Medications for Customized Epilepsy Care

Mapping—and Manipulating— the Brain's Electrical Activity

In addition to its pursuit of new medications and genetic tools, NYU Langone's Epilepsy Center is also actively working with the brain's electrophysiology—using electrodes to study the brain's networks and

Skull Base Surgery: The Best Route In

A LEADING SKULL BASE SURGEON EMPLOYS WIDELY DIVERGENT APPROACHES FOR TWO PATIENTS WITH DEEP SEATED TUMORS

“Ten years ago, I would have used an open-skull procedure to take this tumor out,” says Chandranath Sen, MD, professor of neurosurgery and director of NYU Langone’s division of skull base surgery and cranial nerve disorders. He is studying the MRI image of a recent case: a 46-year-old woman who came to him with steadily failing vision in both eyes due to a large benign tumor at the bottom of her brain, directly behind the sinuses. Despite its sensitive location deep inside the skull, however, he was able to use a minimal access endoscopic approach to remove this particular tumor, entering through the nostrils.

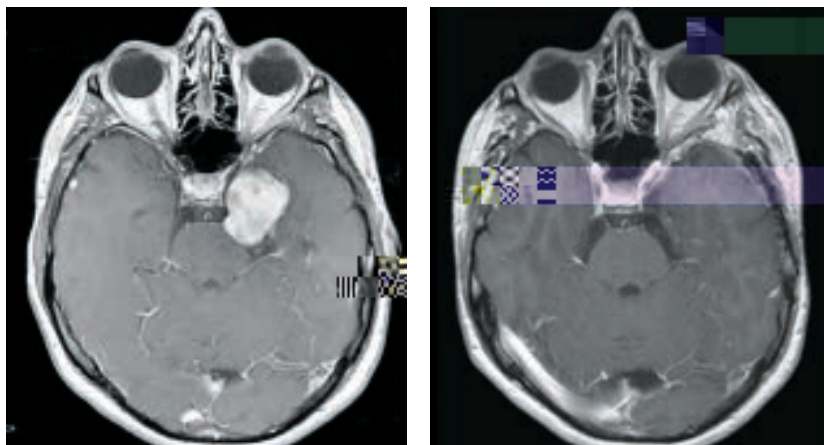
“I could take that approach because the tumor was at the base of the brain, in the midline even with the nose, and also because minimally invasive instrumentation is continuing to improve significantly,” notes Dr. Sen.

“The newer scopes offer better vision, and the surgical instruments are longer and more versatile.” As a result of these advances, Dr. Sen is now doing a greater percentage of endoscopic procedures every year.

“The patient was very distraught, of course,” continues Dr. Sen, returning to the case at hand. “The tumor was in a region that controls many important functions, including the pituitary gland, and was also pressing on her optic nerves. We knew she would likely suffer loss of pituitary function from the operation, and that there could be residual damage to her vision. Our goal was to stop her vision from getting any worse, by completely removing the tumor.”

At the start of her procedure, Dr. Sen teamed with Richard A. Lebowitz, MD, associate professor of otolaryngology, to thread an endoscope through the sinuses to the anterior wall of the skull base. There, using stereotactic guidance to navigate between the optic nerves, he drilled into the base of the skull itself. The dura was opened to bring the tumor into clear view. The tumor was gradually fragmented and separated from the optic nerves and the nearby blood vessels at the skull’s base to remove it completely, and the opening at the base was then carefully closed to prevent leakage of spinal fluid into the nose and infection from going up into the brain.

By the end of the six-hour procedure, Dr. Sen had successfully removed all of the tumor except some grayish remnants along the walls of the third ventricle. Today, the patient is receiving hormone therapy from an endocrinologist to compensate for her damaged pituitary function, but is otherwise living a normal, active life.



▲ LEFT: Preoperative MRI. RIGHT: Postoperative MRI.

WHY MINIMAL ISN'T ALWAYS OPTIMAL:
THE IMPORTANCE OF OPTIONS IN SKULL BASE SURGERY

While Dr. Sen acknowledges the appeal of endoscopic procedures, which can result in faster and easier post-surgical recovery compared to craniotomy, he cautions

Multiple Sclerosis Center Adds a World-Class Pediatric Component

NEW DIVISION CHIEF IS A PIONEER IN DIAGNOSING AND TREATING CHILDREN WITH MS

Ten years ago, when Lauren B. Krupp, MD, professor of neurology, established the United States' first center for pediatric multiple sclerosis, at Stony Brook University Hospital, the idea that children and adolescents could develop MS was still novel. "The teaching in medical schools used to be that kids couldn't get multiple sclerosis," she says. "When children were actually diagnosed with the condition, families faced a lot of skepticism from their health care providers."

Today, physicians around the world utilize pediatric MS medical definitions and treatment guidelines that Dr. Krupp helped develop, and research on the condition is expanding rapidly. In the U.S., Dr. Krupp teamed with the National Multiple Sclerosis Society to promote pediatric MS research, which led to a cooperative network of pediatric MS centers.

NYU Langone Medical Center joined that network when Dr. Krupp, who specializes in adult and pediatric MS, was appointed head of NYU Langone's Multiple Sclerosis Comprehensive Care Center and established the Pediatric MS Center in 2015. Together with long-time colleagues she brought on board, Dr. Krupp has built a world-class pediatric MS program in New York City virtually overnight. Her team—including a pediatric neurologist, a neuropsychologist, a social worker, and a pediatric nurse—works closely with patients and their families to address physical, psychological, and social issues related to pediatric MS. The program also connects young MS patients through activities such as Teen Adventure Camp, a national, philanthropy-supported summer camp for adolescents with MS.

LEADING THE SEARCH FOR NOVEL MS THERAPIES

NYU Langone is also deeply involved in developing new treatments for adult multiple sclerosis, running over 40 clinical trials—including research on medications, genomics, radiological imaging, and rehabilitation to improve specific symptoms and overall quality of life.

Some of the most cutting-edge research was presented at the 2015 annual meetings of the American Academy of Neurology and the European Committee

for Treatment and Research in MS (ECTRIMS). One presentation showed that natalizumab, currently one of the most effective MS medications, produced good outcomes when taken every eight weeks instead of four, with zero incidence of progressive multifocal leukoencephalopathy (PML)—a potentially deadly side effect that can occur with the shorter dosing interval.

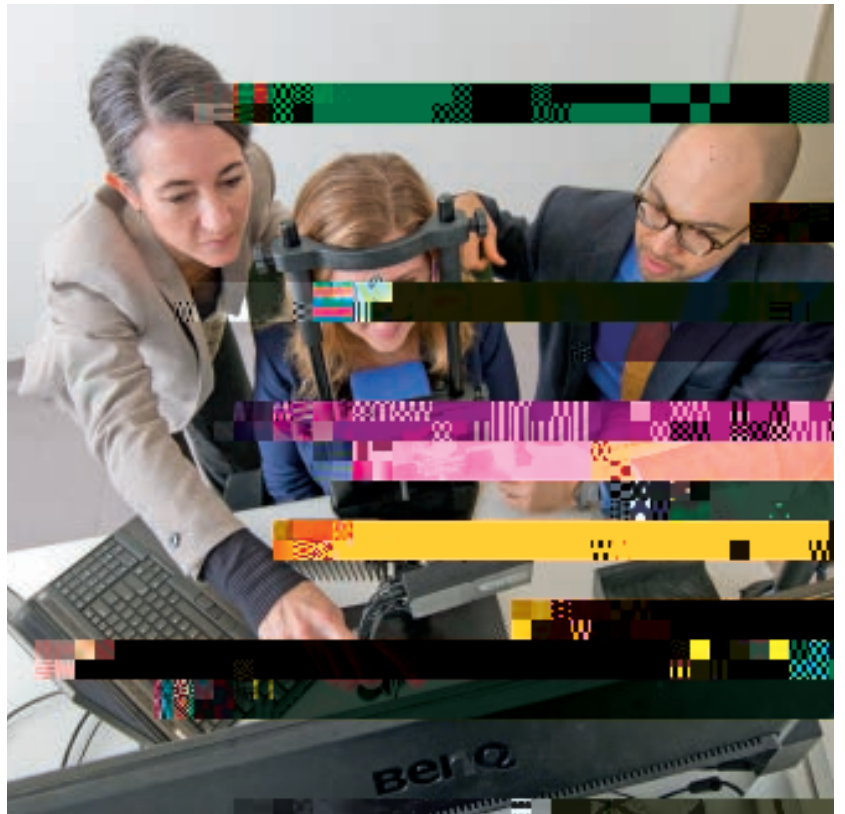
In addition, NYU Langone researchers published studies last year showing that an experimental cancer drug, GANT61, protects brain myelin and reverses MS-like symptoms in chemically damaged mice. NYU Langone also has extensive clinical experience with ocrelizumab, a potential breakthrough drug that reported positive phase III trial results at last year's ECTRIMS conference for both relapse-remitting and primary progressive MS. "We'll be at the forefront of using the drug when it becomes available," says Dr. Krupp.

NON PHARMACEUTICAL APPROACHES

MS Center Highlights

→ 31 total posters and presentations

Tracking Concussions Through Eye Scans,





Expanding Residencies and Fellowships to Optimize Training Opportunities

Given their highly skilled faculty and comprehensive educational programs, NYU Langone's Departments of Neurology and Neurosurgery are uniquely qualified to train physicians in respective specialties—a fact reflected by the increasingly strong nationwide demand in recent years for resident slots within the two departments. With a growing volume of patients and resident applicants, both departments increased the size of their residency programs in 2015. The Department of Neurology added three residency positions for a total of 33, while the Department of Neurosurgery expanded from 14 to 18 residents. Plans call for moving to three neurosurgery residents per year in the near future to reach a departmental total of 21, which will make it the largest program of its kind in New York City.

Thanks to the support of the Morris and Alma Schapiro Fund, the Medical Center also launched a new vascular neurology fellowship last year, with the first fellow starting in July 2015, and added a second multiple sclerosis fellowship position. In addition, the Department of Neurology recently instituted a policy in which all junior faculty members, regardless of tenure status, are assigned a mentoring committee to provide guidance and advice on career development to residents.

Both neurology and neurosurgery faculty have engaged in numerous other global initiatives in recent years, bringing their expertise to regions with limited access to specialized medical care. In the past year, these global efforts included the following:

- Ruben Kuzniecky, MD, professor of neurology and co-director of NYU Langone's Comprehensive

Education and Training on an International Scale

The Department of Neurology recently established a global health division to coordinate its overseas efforts and to implement a global health elective as part of its residency program. In 2015, its first full year of activity, the division sponsored its first global health elective course for residents. Alexandra Lloyd-Smith, MD, a third-year resident, spent her three-week elective on the neurology ward at Mulago Hospital in Kampala, Uganda, where she was joined by global health program director Jaydeep Bhatt, MD, clinical assistant professor of neurology. There, they experienced a wide array of neurological infectious and non-communicable disease (NCD) burden and resource-limited treatment paradigms.

NEUROLOGY

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Fallah A, Rodgers SD, Weil AG, Vadera S, Mansouri A, Connolly MB, Major P, Ma T,

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NEUROLOGY

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