NYU Langone
MEDICAL CENTER

IN *U.S. NEWS & WORLD REPORT*

OF EXCELLENCE

CONFERENCE POSTERS AND PRESENTATIONS

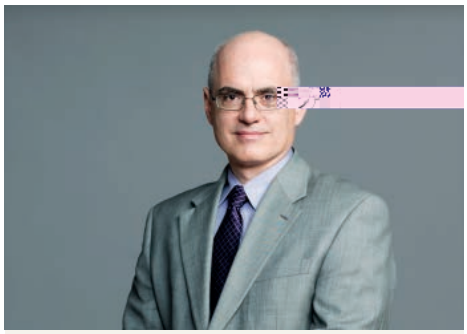
THE "TRIPLE AIM" OF REHAB CARE

EARLY MOBILIZATION PROGRAM

2015

YEAR IN REVIEW

This year marked the 65th anniversary of Rusk Rehabilitation, founded by



STEVEN R. FLANAGAN, MD

Howard A. Rusk Professor of
Rehabilitation Medicine

Chair, Department of Rehabilitation Medicine

Medical Director, Rusk Rehabilitation

[illegible]

CLINICAL VOLUME

10,000
[illegible]
a 12% increase compared to 2014

2,500+
[illegible]

1,000
[illegible]
seen by Rusk's Inpatient Cardiac - Medically Complex Rehabilitation Program since it reopened in 2013

CLINICIANS

77
[illegible]
11% of all the certified specialists in New York State are part of Rusk Rehabilitation

31
[illegible]
at NYU Langone's Hospital for Joint Diseases

RESEARCH AND FUNDING

$6.4 +
[illegible]
25 active research studies

$3.5 +
[illegible]

38
[illegible]

AND

130+
[illegible]
delivered by Rusk clinicians in 2015 at national and international conferences

EDUCATION

23
[illegible]
around the U.S., both current and former, who have graduated from Rusk's residency program

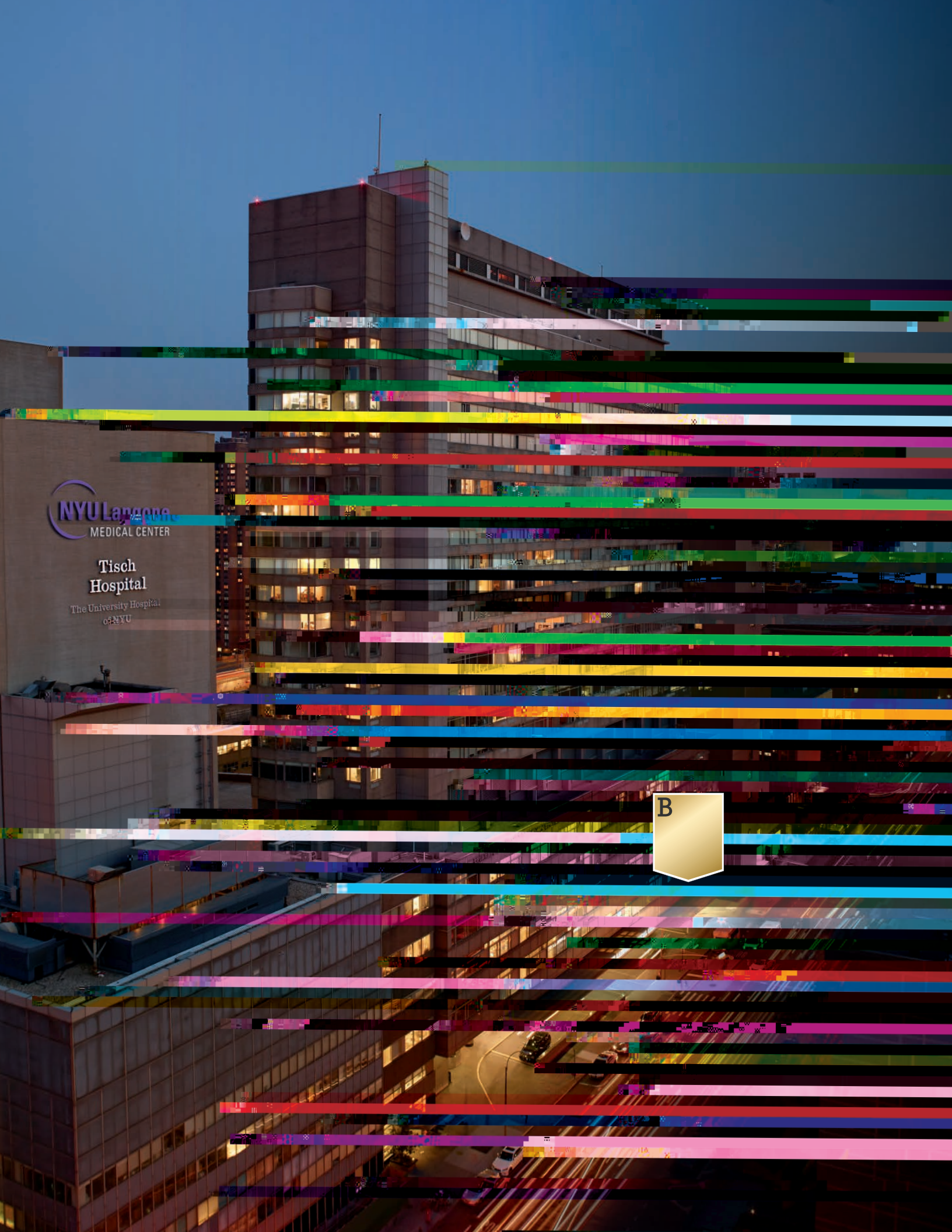
10,000+
[illegible]
Rusk Insights on Rehabilitation Medicine podcast is available on iTunes and other podcast apps

1 of 6
[illegible]
in the country. Rusk also has physiatry fellowships in sports medicine and pediatrics

2
[illegible]
- neurological rehab
- musculoskeletal, in partnership with NYU Steinhardt

ACCOLADES

[illegible]
for rehabilitation in *U.S. News & World Report*'s "Best Hospitals" since the rankings began in 1989


NYU Langone
MEDICAL CENTER
Tisch
Hospital
The University Hospital
of NYU
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With the merger between NYU Langone and Lutheran Medical Center complete as of January 2016, Brooklyn residents will now have access to expanded adult and

Rusk hit the digital airwaves in June 2015, launching a podcast available free on iTunes for PM&R professionals. *Rusk Insights in Rehabilitation Medicine,* which has had more than 10,000 downloads since launching, is hosted by Tom Elwood, DrPH, retired executive director of the Association of Schools of Allied Health Professions in Washington, D.C., and the author of two books on allied health. The podcast reviews a broad range of current topics through interviews with Rusk faculty and sta , including Jonathan H. Whiteson, MD, assistant professor of rehabilitation medicine and medicine, and director of cardiopulmonary rehabilitation at Rusk, who discussed encephalopathy and delirium in the cardiopulmonary rehabilitation setting; Brian S. Im, MD, assistant professor of rehabilitation medicine and director of the Traumatic Brain Injury Program, who addressed the influence of cultural disparities on brain-injury rehabilitation; and Prin Amorapanth, MD, PhD, instructor of rehabilitation medicine, who is examining the use of transcranial electrical stimulation to improve emotional regulation in patients with acquired brain injuries. The show also featured live broadcasts from the American Academy of Physical Medicine and Rehabilitation (AAPM&R) annual assembly in Boston, in October.

Rusk has an important part in the Spine Center at NYU Langone, which formalized a longtime surgical collaboration between its spine specialists in the Departments of Orthopaedic Surgery and Neurosurgery. The center encourages new patients to call a central number for the appropriate referral, and provides comprehensive spinal care, leveraging the skills of specialists in surgery and PM&R. Rusk physiatrists perform complete spine evaluations, discuss di erential diagnoses and non-surgical management of spine pain, and inform patients of orthopaedic conditions rooted in the hip, knee, shoulder, or hand that can mimic spine-related pain. “We don’t merely assess if a patient is a candidate for surgery; we aim to maximize non-operative options first, hopefully preventing the need for surgery,” notes Salvador E. Portugal, DO, interventional physiatrist and board-certified specialist in sports medicine. Physiatrists at the Spine Center also perform numerous procedures, including radiofrequency ablation and epidural, facet, and sacroiliac joint injections.

NYU Langone was recently awarded a $1.2 million Empire Clinical Research Investigator Program grant from the New York State Department of Health for a two-year study on concussion. Researchers, including Prin Amaorapanth, MD, PhD, instructor of rehabiliation medicine, hope to identify diagnostic vision-based performance measures, neuroimaging techniques, and serum markers that can capture neurologic signs and sequelae of sports-related concussion with long-term exposure to contact sports. Structural, functional, and biological markers identified in these projects may be applied across the spectrum of TBI/concussion, from acute sideline diagnosis in youth and collegiate cohorts to measurement of potential signs, in vivo, of chronic traumatic encephalopathy (CTE) among active and retired contact-sports athletes. Collection and analysis for some of the studies funded by

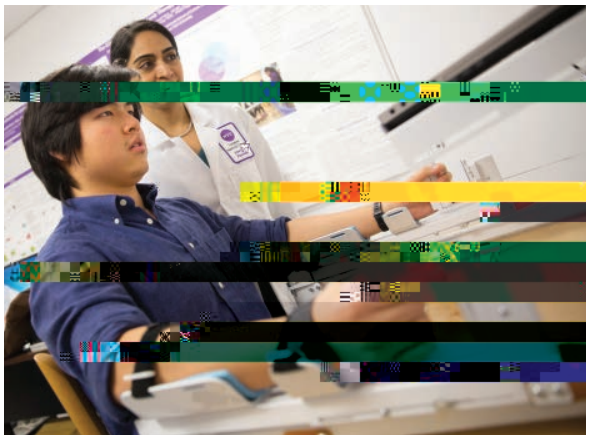
Camp High-Five, Rusk's constraint therapy program for children with neurological- or orthopaedic-rooted weakness in one arm or hand, made strides in 2015 with many enhancements. Those enhancements included: the move from a two-week to a four-week therapy camp, with the first two weeks focused on modified constraint-induced therapy and the second two weeks involving bimanual task training; a greater emphasis on home exercises at the program's conclusion; and the addition of one full-time certified occupational therapist to co-direct the camp. Concurrently, the camp's evaluation processes were modified in order to track patient outcomes and movement gains over a longer time horizon, with evaluation methods added both three and six months after the conclusion of camp. Overall, the addition of bimanual training led to greater positive changes for camp participants according to Melbourne-2 and parental assessment measures, with 67 percent of children demonstrating range of motion improvement, 89 percent demonstrating greater accuracy using their a ected upper extremity, and 87 percent of parents reporting a positive change in their child's use of the a ected upper extremity.

In 2015, Rusk received Graduate Medical Education Committee (GMEC) approval for an acupuncture track in its PM&R residency. The program, which started in January for third-year residents, is a collaboration with the Tri-State College of Acupuncture (TSCA). Rusk is incorporating distance learning, hands-on intensives, didactic classes, and clinics at both NYU Langone's

Dr. Raghavan led development e orts for a range of patented motor rehabilitation devices now being used at Rusk and elsewhere.

The m² BAT is based on the principle of "mirrored motion," which stimulates the two sides of the brain to work together to restore movement in the a ected arm after a stroke. This year, the m² BAT was cleared by the FDA as a Class 1 device and is now being used by Rusk therapists in stroke rehabilitation. What makes the m²

Also, Dr. Rizzo's research into how stroke a ects control of eye movements may revolutionize the approach to rehabilitation after stroke. Using sophisticated camera technology, researchers record the eye movements of stroke patients in fine detail. Subjects are asked to follow targets that move around very quickly on a computer screen. The test measures saccadic eye movements, a physiologic event in which an individual quickly moves his gaze from one point of interest to another. Dr. Rizzo and his team expected to find that despite normal visual evaluations, stroke patients would have impaired saccadic eye movements. Specifically, the team hypothesized that the eye movements would be slowed. However, they found the opposite. Subjects exhibited faster initiation times of saccadic eye movements. Dr. Rizzo and the team have hypothesized that these findings suggest a disinhibition phenomenon, akin to other phenomena after stroke such as hyperreflexia and spasticity, that suggest impairment in the cortical braking system. The extent of impairment in eye movement control may reflect the state of the neural systems and inform rehabilitation strategies.



▲ Preeti Raghavan, MD, working with a research assistant on the m2 BAT device

Motor Planning: Studying Vector-Coded Reach Plans

In an e ort to help stroke patients recover muscle function, therapists at Rusk Rehabilitation are conducting innovative research to study how human beings interact with objects in their environment. Past research has indicated that when planning a movement, healthy individuals take into account information about both the direction and extent of the movement, as well as the overall goal of the movement.

Rusk researchers tried to determine whether the individuals who had a stroke also incorporate both kinds of information in movement planning. They found that individuals with stroke have more di iculty planning the direction and extent of movements than with the goal of the movement. However, there were di erences based on the side of the brain that had the stroke. The findings have implications for the development of personalized approaches to post-stroke rehabilitation.

Novel Ideas in the Use of Mirror Therapy

In addition to using the concept of mirror therapy for stroke patients, Rusk therapists are also exploring new applications for amputee patients. At international conferences this year, Rusk physical therapists presented research on the use of mirror therapy in the inpatient acute rehab setting for the reduction of phantom limb pain after bilateral transfemoral amputations. "There is a lot of current research about therapy for unilateral injuries," said Jennifer Eftychiou, PT, DPT. "But because the number of bilateral amputations is rising, we need a technique to reduce phantom limb pain for these patients, too. The use of mirror therapy is now part of our daily practice with patients who complain about phantom pain."

To achieve the same-day target, Roy I. Davidovitch, MD, assistant professor of orthopaedic surgery and director of the Hip Center at NYU Langone, and the multi-disciplinary team at Rusk worked together to implement significant clinical and operational changes. As Dr. Davidovitch fine-tuned the surgical procedure involving soft-tissue-sparing techniques, performing more than 1,000 minimally invasive procedures until he achieved same-day discharge, Rusk clinicians at NYU Langone's Hospital for Joint Diseases developed a workflow initiative that streamlined rehabilitation operations. They coordinated plans for patient care with anesthesiologists, pharmacists, surgeons, social workers, and nurses in the OR and PACU, and created an online calendar that replaced team-wide emails and enabled better tracking of patients pre- and post-surgery. Clinicians also adjusted their hours, adopting a flex schedule rather than a traditional day shift. Protocols initiated during a pilot program running from January to April 2015 continue to be implemented by therapists and other members of the team.

"The success of same-day total hip replacement mostly depends on multidisciplinary logistical planning involving our physical and occupational therapists, post-op recovery and discharge nursing, as well as anesthesiologists," says Dr. Davidovitch. "Without a carefully coordinated team e ort, even the best surgery in the most ideal patient will not yield the success that we have seen discharging our patients safely on day zero with zero readmissions to date."

By shifting the focus from postoperative to preoperative care, clinicians have facilitated same-day discharge for more than 55 patients who have undergone a minimally invasive anterior approach to the surgery. Though more detailed outcomes data is being tracked, the program has thus far achieved one important measure of success: None of the 55 patients have been readmitted.

▼ Roy I. Davidovitch, MD, (left) assesses a patient's ability to walk independently prior to discharge, following a total hip replacement procedure earlier in the day

On the day of hip-replacement surgery, clinicians who conducted the original intake review all information with each patient and his or her coach. After the 60-minute procedure—which is ideally completed by 9 am—and an additional one to two hours in the PACU, patients meet with therapists to identify the most appropriate ambulatory device for discharge and to practice moving with their new hip. The day after surgery, a physical therapist and a nurse visit each patient at home. For an additional two weeks, home care agency nurses and therapists work with patients, who generally return to work within that time frame. The goal is to help patients resume all presurgery activities within six weeks.

In 2016 Rusk clinicians will work with NYU Langone's orthopaedic surgeons and others from the multidisciplinary team to increase the number of same-day hip replacement procedures and will initiate a pilot program for same-day discharge for patients having total knee replacements.

55+

have been discharged the same day as their total hip replacement at NYU Langone

Rusk Rehabilitation, known throughout New York City for its expertise in managing medically complex patients, has become a major referral center for patients requiring a full spectrum of care. “These patients tend to be older, they tend to have heart failure, and they tend to have other comorbidities, like arthritis and neuropathy. They may have had strokes in the past, but now they’ve had their valve surgery and we bring them on to the unit to rehabilitate them,” notes Jonathan H. Whiteson, MD, assistant professor of medicine and rehabilitation medicine, and director of cardiopulmonary rehabilitation.

Increasing numbers of patients at Rusk have undergone transcatheter aortic valve replacement (TAVR), an emerging surgical technique for patients with aortic stenosis who are too high risk for traditional open-heart surgery. TAVR, performed at NYU Langone

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▲ Megan Evangelist, MS, OTR/L, with an LVAD patient involved in Rusk Rehabilitation's early mobilization program

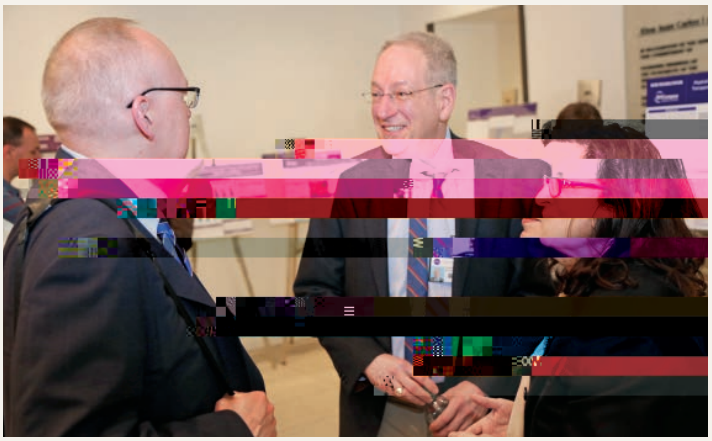
CONCUSSION CENTER

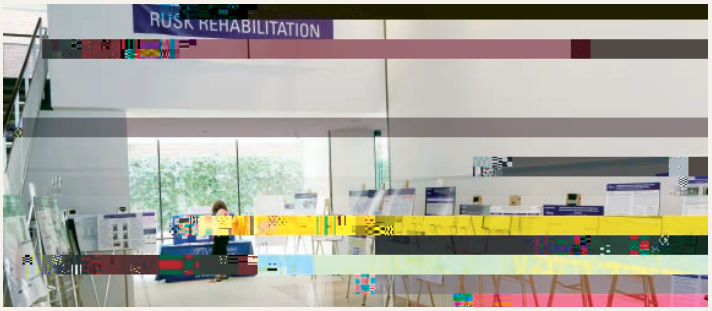
▼ Janet Rucker, MD, and J.R. Rizzo, MD, using eye-tracking technology to study concussion

New Smartphone App Monitors Patient Recovery, Aids Research

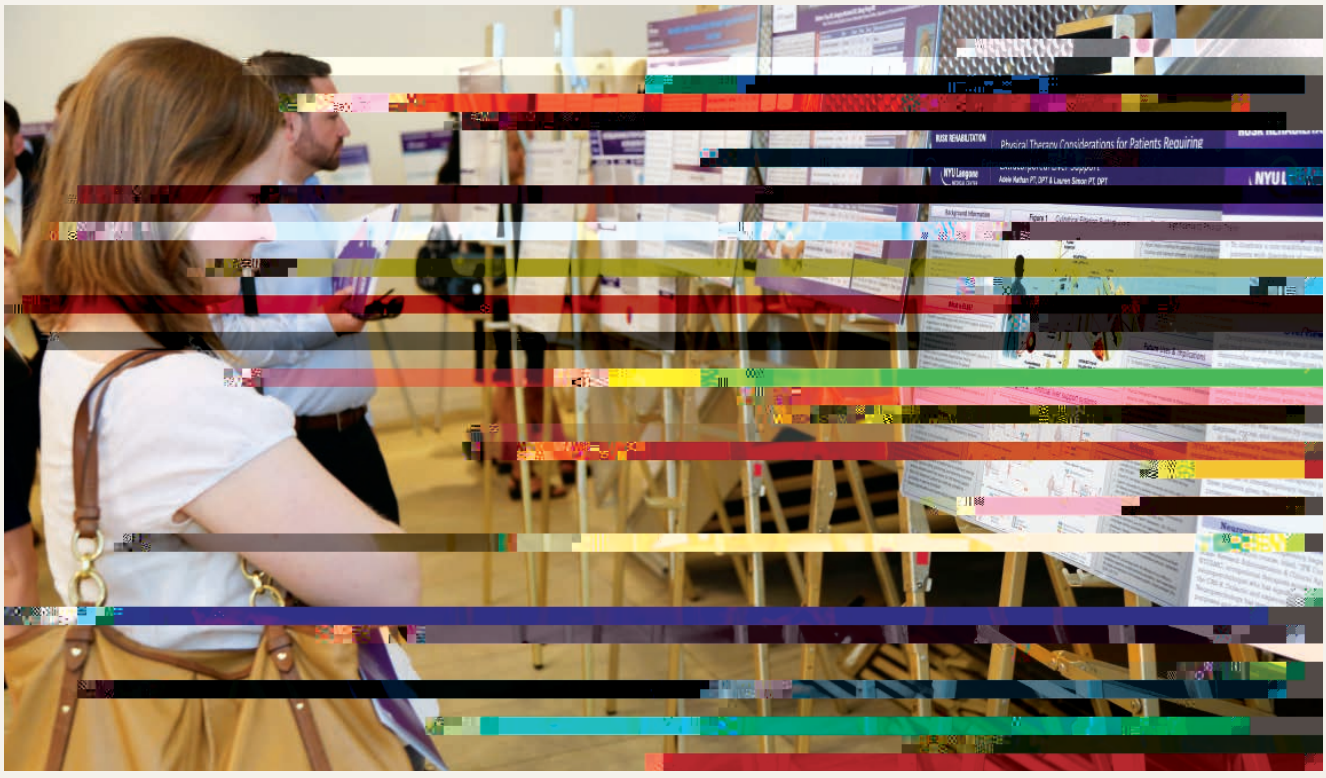
65

To celebrate this historic milestone, NYU Langone hosted a special Rusk Rehabilitation Research Day symposium that included lectures and technical exhibits from top experts at Rusk. Internationally renowned bionics expert Alberto Esquenazi, MD, chairman of Physical Medicine at MossRehab in Philadelphia, was honored with the Rusk Award for Innovation and Leadership to





▲ Bottom left: Rusk research leadership with Alberto Esquenazi, MD, chairman of Physical Medicine at MossRehab, who was honored with the 2015 Rusk Award for Innovation and Leadership


Physical Therapy Considerations for Patients Requiring
NYU

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Glubo H, McDermott H, Smith-Wexler L, Im B, Bushnik T. Disability as diversity & diversity in disability: examples from brain injury rehabilitation research.

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Kim S, Zemon V, Cavallo M, Rath J, McCraty R, Foley F. Heart rate variability biofeedback, emotional regulation,

SENIOR LEADERSHIP

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RUSK PHYSICIANS

A t , ,
Clinical Instructor

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Clinical Instructor

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Clinical Instructor

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Rehabilitation Medicine
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Assistant Professor of
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Laboratory (VMIL)
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in Medicine Laboratory (TTML)

CLINICAL AND SITE LEADERSHIP

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Medicine, NYU Lutheran

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Site Director, Tisch Hospital

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Clinical Assistant Professor
of Rehabilitation Medicine
Director, Outcomes Management

C . , A, BB
Director, Operations

Divisional Administrator

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Clinical Professor of
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Director of Rehabilitation Medicine,
Bellevue Hospital Center

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Site Administrator,
Center for Musculoskeletal Care

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Director of Strategic Initiatives

. , , CCC-
Clinical Director,
Speech Language Pathology

, A,
Director, Rehabilitation Compliance

, , , AB
Professor of Rehabilitation
Medicine and Psychiatry
Director, Rusk Psychology

, ,
Clinical Associate Professor of
Rehabilitation Medicine
Director of Rehabilitation Medicine,
Veteran A airs-New York
Harbor Healthcare System

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Clinical Director, Physical Therapy
Site Director for Ambulatory Services

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Clinical Assistant Professor of
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Site Director, Hospital for
Joint Diseases

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Clinical Director,
Occupational Therapy

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Senior Vice President for
Communications and Marketing

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Vice Dean, Chief of Sta

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Senior Vice President and Vice Dean
for Real Estate Development and Facilities

Senior Vice President and Vice Dean,
Chief Information O cer

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Senior Vice President and Vice Dean,
Chief of Hospital Operations

Senior Vice President and Vice Dean
for Human Resources and Organizational
Development and Learning

NYU LANGONE MEDICAL CENTER

1,069
Total Number of Beds

77
Operating Rooms

38,554
Patient Discharges

1,216,428
Hospital-Based Outpatient Visits

5,766
Births

2,900,000
Faculty Group Practice
O ce Visits

1,469
Full-Time Faculty

1,392
Part-Time Faculty

2,627
Voluntary Faculty

128
Endowed Professorships

2,740
Physicians

3,465