NYU Langone
MEDICAL CENTER

RUSK REHABILITATION

2014 YEAR IN REVIEW

CONTENTS

MESSAGE FROM THE CHAIR

Dear Colleagues and Friends,

It gives me great pleasure to share with you the 2014 annual report for Rusk Rehabilitation, which highlights the milestones we've met as we also look forward to the future.

Rusk Rehabilitation has a unique and distinguished history, founded by Howard A. Rusk, MD, as one of the first rehabilitation facilities in the country and the first affiliated with a university medical center. We are incredibly proud of this history and continue to harken back to and espouse Dr. Rusk's philosophy of multidisciplinary care and treating the whole person, on which his Institute for Rehabilitation Medicine was built.

We also have a more recent unique and distinguished history: the journey of transformation and evolution that has taken place over the past few years.

Rusk Rehabilitation has adapted and progressed, tailoring our programs and services to better meet the needs of a shifting patient population and provide more efficient, effective care in a changing healthcare environment. We said farewell to the building known as the Rusk Institute and relocated Rusk Rehabilitation to new state-of-the-art facilities situated across the NYU Langone campus, including nine locations throughout the tri-state area. We expanded our clinical faculty, adding experts in sports and pain medicine, rehabilitation psychology, and integrative medicine. We solidified our reputation as a leading center for the treatment of concussion with the formation of our multidisciplinary Concussion Center, and improved clinical outcomes in ICU patients through intensive early rehabilitation. We developed novel pediatric care programs, including training in adaptive sports and caregiver education for parents of pediatric brain injury patients.

Our research program has also expanded, with a four-fold increase in total NIH grant funding. We completed our second year as a National Institute on Disability and Rehabilitation Research (NIDRR) Traumatic Brain Injury Model System (TBIMS) center, increasing understanding of how TBI affects urban populations, including the homeless. Our Motor Recovery Research Laboratory has led to several breakthrough technologies helping patients recover mobility and fine motor control after a stroke or brain injury. And in 2014, Rusk Rehabilitation was selected as one of five U.S. centers conducting clinical research on the Indego® exoskeleton.

We are extremely fortunate to have the most dedicated and skilled faculty and staff; the most committed and supportive leadership at NYU Langone Medical Center; the most expert and collaborative colleagues in other Medical Center departments; and the most cutting-edge facilities and equipment to carry out the best possible patient care, research, and education.

I am proud of the history that stretches back to Dr. Rusk, but I am most proud of the accomplishments of our recent history, which is reflected in the following pages. With such a strong history behind us, our future success is assured.

STEVEN R. FLANAGAN, MD

Howard A. Rusk Professor of Rehabilitation Medicine

Chair, Department of Rehabilitation Medicine

Medical Director, Rusk Rehabilitation

NYU Langone Medical Center

FACTS & FIGURES*

Rusk Rehabilitation

#9 in the country

for rehabilitation in *U.S. News & World Report*'s "Best Hospitals" survey.

#13 research ranking

in the Blue Ridge Institute for Medical Research list of National Institutes of Health (NIH)-funded research programs for PM&R.

$2.2 million+ in grant funding

In 2013, Rusk Rehabilitation had $561,733 in total grant funding. In 2014, Rusk's grant funding grew to $2,208,439. Eleven new grants were awarded in 2014.

65 PT specialists

including at least one in each of the eight American Board of Physical Therapy Specialties (ABPTS)-recognized specialties.

1,000+ patients

Rusk plays a central role in NYU Langone's Concussion Center, which has treated over 1,000 patients since its establishment in 2013.

1,489 inpatients

- 312 stroke
- 207 brain injury
- 124 pediatrics
- 846 Comprehensive Integrated Inpatient Rehabilitation Program
  - 275 orthopaedic
  - 213 cardiac
  - 114 pulmonary
  - 92 neurological
  - 77 spinal cord
  - 20 limb loss

4 CARF-accredited rehabilitation programs

- Adult brain injury
- Adult inpatient
- Pediatric specialty
- Adult stroke specialty inpatient

160,000 patient encounters

475+ clinicians on staff

- 226 Physical Therapists
- 79 Nurses
- 62 Occupational Therapists
- 37 Psychologists
- 35 Speech Language Pathologists
- 24 Physiatrists
- 8 Horticulture Therapists
- 7 Vocational Counselors
- 4 Exercise Physiologists

$691,000+ in major gifts

Supporting pediatric and brain injury medicine fellowships; integrative medicine programs and research; research in physical therapy and cardiac rehabilitation; musculoskeletal care; and pediatric rehab programs and services.

12,100+ outpatient visits

representing 4.5 percent increase from the prior year.

95% patient satisfaction

95% of Rusk patients reported satisfaction in overall care, according to a Press Ganey survey.

278 participants

of Rusk's PM&R review course in 2014, including digital downloads and in-person attendees.

*Numbers represent FY14 (Sept 2013–Aug 2014) unless otherwise noted

NYU Langone Medical Center

Ranked #1 for Two Years in a Row

in overall patient safety and quality, among leading academic medical centers across the nation that participated in the University HealthSystem Consortium Quality & Accountability Study

UHC Quality Leadership Award 2014 WINNER

Ranked #15 on "Best Hospitals" Honor Roll

by *U.S. News & World Report* and nationally ranked in 13 specialties, including top 10 rankings in Orthopaedics (#4), Rheumatology (#6), Geriatrics (#8), Neurology & Neurosurgery (#8), and Rehabilitation (#9)

BEST HOSPITALS U.S.News HONOR ROLL 2014-15

Ranked One of the Top 20 Medical Schools

by *U.S. News & World Report*

Magnet Designation for Third Consecutive Term

for Tisch Hospital and Rusk Rehabilitation, an honor achieved by only 2% of hospitals in the country. NYU Langone's Hospital for Joint Diseases received its first Magnet recognition in 2012.

MAGNET RECOGNIZED AMERICAN NURSES CREDENTIALING CENTER

NEW & NOTEWORTHY

Transformation Through Growth, Innovation, and Collaboration

ICU Early Mobilization Program Shows Promising Results

Rusk's ICU Early Mobilization project, a 2014 pilot in which therapy services for MICU patients were increased by an average of 60 minutes per day to have them mobilized as soon as possible, yielded impressive results both clinically and operationally. Compared to a control group, the average floor bed length of stay decreased by 30 percent, with an estimated annualized cost savings of $2.2 million. On the clinical side, patient discharges home without services increased from 18 percent to 40 percent.

Three New Fellowships Round Out Rusk Educational Offerings

Marking significant growth in its educational programs, Rusk will claim three physiatry fellowship programs by the summer of 2015, with fellowships in brain injury medicine, sports medicine, and pediatric rehabilitation. The year-long brain injury medicine fellowship is one of only three such accredited programs in the United States. The accredited sports medicine fellowship began mid-summer 2014, and the pediatric-focused program will begin in the summer of 2015.

Rusk also welcomed a physical therapy resident in neurorehabilitation in 2014, and plans for a second in 2015. This residency has been recognized as a developing program by the American Physical Therapy Association—the next step toward accreditation.

Rusk Visuomotor Integration Laboratory (VMIL) Leader Recognized

In 2014, Rusk researcher John-Ross Rizzo, MD, assistant professor of rehabilitation medicine and director of the Visuomotor Integration Laboratory (VMIL) and the Technology Translation in Medicine Laboratory (TTML), was lauded by several professional and peer organizations for his vision and leadership. *Crain's New York Business* named Dr. Rizzo to its "40 under 40" 2014 list for the work out of VMIL, including a three-pronged wheeled cane, a sensor-equipped vest, and other innovative technologies to assist the visually impaired. Dr. Rizzo's other 2014 accolades include:

- Association of Academic Physiatrists' *Rehabilitation Medicine Scientist Training Program* Grant Award Recipient
- Oxford Center for Entrepreneurs "Rising Star Entrepreneur" 1st Prize
- Nominated for the Cooper Hewitt, Smithsonian Design Museum's 2014 People's Design Award
- Applied Research Support Fund Award for Invention at NYU Langone Medical Center
- Foundation for Physical Medicine and Rehabilitation — Richard Materson Education Research Fund Research Award Winner
- National Collegiate Inventors and Innovators Alliance E-Team Winner
- New York City Economic Development Corporation's Health 2.0 Pilot Health Tech NYC Host Award Winner
- 1st place in Hardware for the NYU Poly Innovation Competition
- 1st place in the Tech Ventures for the NYU Stern Business Competition

Education and Training on an International Scale

Rusk's educational efforts have spanned the globe with ongoing international programs. In China, Rusk continues a growing partnership with Qingdao Hospital, where it conducts four yearly training visits. On these visits, Rusk faculty and staff train Qingdao clinicians on the delivery of sports medicine, orthopaedic rehabilitation, and neurorehabilitation care. Stateside, Rusk has also hosted professionals from Qingdao, as well as visiting scholars from Korea, the Philippines, and Israel.

New Rehabilitation Devices Promote Mobility

Rusk was selected as one of only five U.S. centers to conduct clinical research on the Indego®, a lightweight (27-pound) battery-powered exoskeleton that allows individuals with a weakened or paralyzed lower body to stand upright and walk with the help of crutches. Researchers at Rusk's Motor Recovery Research Laboratory have also developed and patented the Finger Independence Trainer—a tool for improving finger extension, to help rehabilitate a hand weakened by stroke or brain injury by exercising unaffected and affected sides simultaneously.

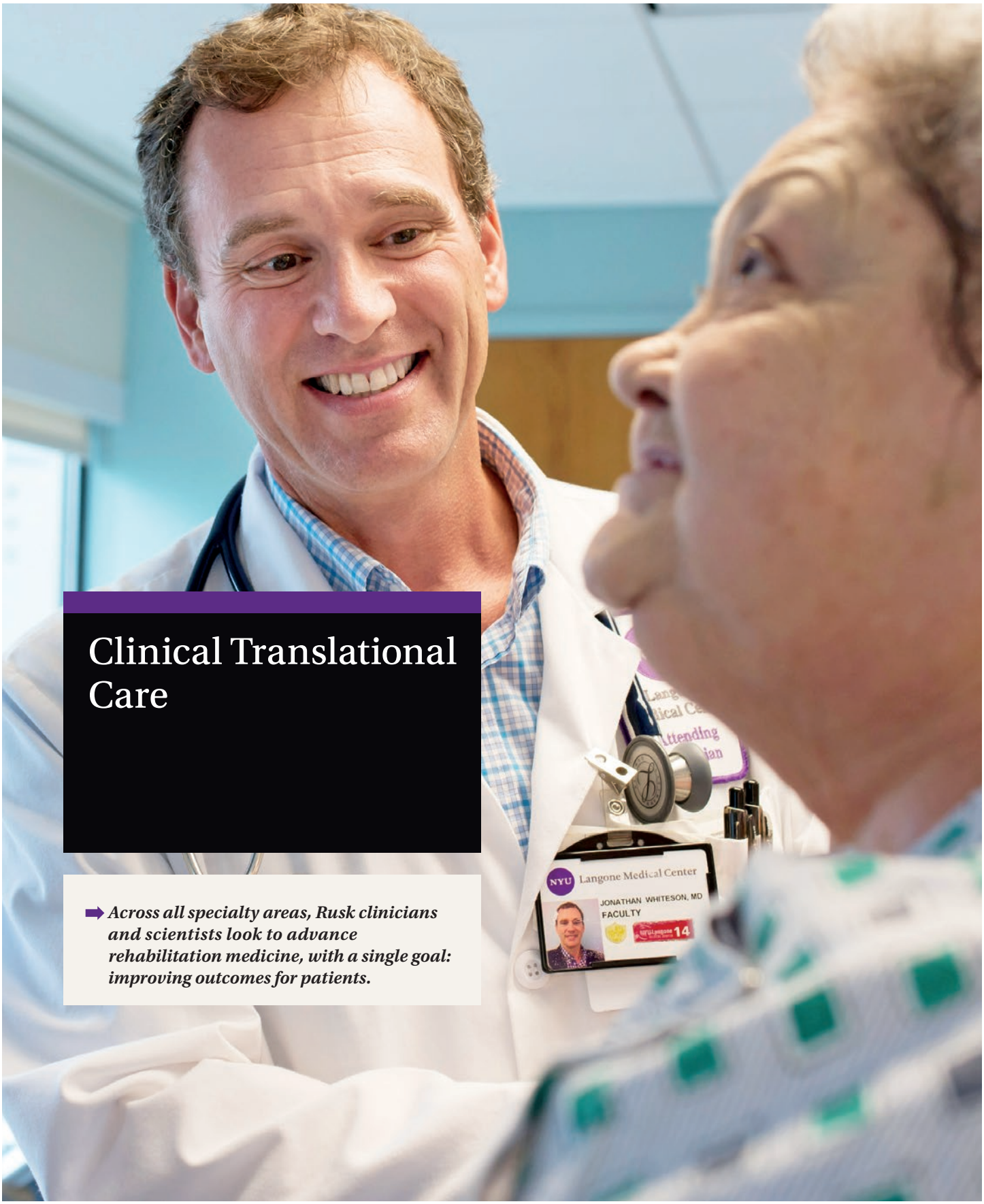
Rusk's Footprint Expands with Additional Locations, Faculty, and Staff

With NYU Langone's growing ambulatory network, Rusk has experienced a significant period of expansion, providing advanced care and rehabilitation services to a growing number of patients throughout the community. Rusk currently provides rehab services at nine locations in the tri-state area, including at NYU Langone's Preston Robert Tisch Center for Men's Health and Joan H. Tisch Center for Women's Health, where Rusk clinicians provide tailored care for the unique health needs of men and women in aesthetically pleasing, cutting-edge facilities. Rusk is also serving the Brooklyn community at NYU Langone's Levit Medical, a bustling, multi-specialty practice with nearly 30 physicians on staff.

This expanding footprint with increasing demand for Rusk services has driven a parallel expansion in faculty, with the recruitment of five new faculty members in the past year:

- **Kimberly A. Sackheim, DO**, assistant professor of rehabilitation medicine, interventional physiatrist, and medical director of Rusk's Women's Health Rehabilitation Program
- **Charles Kim, MD**, assistant professor of rehabilitation medicine and anesthesiology, interventional physiatrist, and double ABMS board-certified specialist in physical medicine and rehabilitation and in pain medicine
- **Salvador E. Portugal, DO**, interventional physiatrist and board-certified specialist in sports medicine
- **Joseph Ricker, PhD, ABPP**, professor of rehabilitation medicine and psychiatry and director of psychology
- **Barbara A. Siminovich-Blok, ND, LAc, MS, NCCAOM Dpl**, assistant professor of rehabilitation medicine and integrative medicine researcher

CLINICAL TRANSLATIONAL CARE



Clinical Translational Care

➡ ***Across all specialty areas, Rusk clinicians and scientists look to advance rehabilitation medicine, with a single goal: improving outcomes for patients.***

Meeting the Challenge of Complexity in Cardiopulmonary Rehabilitation

CARDIOPULMONARY AND MEDICALLY COMPLEX

Cardiopulmonary rehabilitation tends to involve some of the most medically complex patients, such as those with advanced heart failure who have received implantable medical devices, including left ventricular assist devices (LVADs) and pacemaker defibrillators. "Other hospitals in the area are putting LVADs in patients and sending them to us for outpatient cardiac rehabilitation," notes Jonathan H. Whiteson, MD, assistant professor of rehabilitation medicine and medicine, and director of cardiopulmonary rehabilitation at Rusk Rehabilitation. "These are very challenging patients and we are one of the few facilities that can handle that complexity. We're even seeing former LVAD/cardiopulmonary rehab patients return to us for rehabilitation after they get their heart transplants."

Rusk patients also tend to present with multiple comorbidities beyond cardiopulmonary issues, such as those recovering from major surgery, oncology patients, organ transplantation patients, those with polyneuropathies, and patients with a variety of complex and rare disorders. These medically complex patients pose a unique challenge: Not only does the attending physician require particular clinical acuity, he or she must also expertly manage the multidisciplinary teams required for the care of these patients.

Jeffrey M. Cohen, MD, professor of rehabilitation medicine who directs the program for medically complex patients, has been an attending physiatrist at Rusk for over 20 years, and is highly experienced at bringing together these cross-specialty teams for medically complex patients. "Meeting the needs of these patients involves coordinating many different rehabilitation and medical specialists to develop and implement a program tailored to the individual's unique needs. I have the privilege of integrating all of these talents and skills to provide the best possible outcomes for my patients."

DRIVING OUTCOMES WITH RESEARCH: LVAD PATIENTS, COMPLIANCE TOOLS

Rusk's clinical excellence goes hand-in-hand with its leadership in research. Dr. Whiteson is currently working with colleagues on a study assessing the use of rehabilitation to improve cardiac function after LVAD placement for advanced systolic heart failure. "Studies have shown that aerobic activity—a measure of cardiac function—tends to plateau three months after the LVAD is put in," notes Dr. Whiteson. "We're focusing on that post-three-month period to see if an outpatient cardiac rehab program can improve a person's aerobic capacity and fitness level and their endurance for life activities."

Another study in the planning stages will evaluate whether use of an interactive electronic health app can extend long-term compliance with a program of healthy lifestyle changes among heart attack patients who have completed outpatient cardiac rehabilitation. Research has shown that compliance to a program of lifestyle changes typically falls off rapidly within 12 months of completion of cardiac rehabilitation. Researchers at Rusk Rehabilitation plan to use the health app to send information on nutrition and exercise to study participants, as well as to collect data on activity, blood pressure, and weight. These data will allow researchers to track whether participants are becoming noncompliant, so that encouragement might lead to better adherence.

327
patients
treated in 2014

CLINICAL TRANSLATIONAL CARE

COLLABORATION AND COMMUNICATION ACROSS THE CONTINUUM OF CARE

The hallmark of Rusk's approach is a "continuum of care" that provides rehabilitation services across both inpatient and outpatient settings. This approach depends on effective communication and collaboration with colleagues at NYU Langone, as well as those at other institutions and in the community. "We'll work with the patient's primary care doctor, their cardiologist or pulmonologist, and their home caregivers to continue shaping their care," explains Dr. Whiteson. "This allows us to better understand our patients' rehabilitation needs and to ensure the success of our treatment plans."

That collaborative approach is also critical to early rehabilitation efforts, which, research shows, help get cardiopulmonary patients back on their feet sooner, shortens inpatient hospital stays, and improves outcomes. The cardiopulmonary acute care team at Rusk has made early mobilization and rehabilitation a priority for inpatients, working closely with surgical teams and others to make sure that rehabilitation can happen as quickly as possible. Many cardiac surgery patients even receive "prehabilitation" in advance of major cardiac surgery to speed recovery and improve outcomes.

EXPANDING FACILITIES TO MEET GROWING DEMAND

To meet growing demand for outpatient cardiopulmonary treatment, Rusk has recently expanded its outpatient facilities and services. The outpatient cardiopulmonary program is based at NYU Langone's Ambulatory Care Center, which opened in 2012 and includes a new gym featuring exercise equipment with full heart-function monitoring, and a facility dedicated to advanced cardiopulmonary stress testing. Inpatient care is also provided through a 25-bed cardiac rehabilitation subacute unit at Jewish Home Lifecare's campus in upper Manhattan.

TAKING REHAB MEDICINE TO THE AIRWAVES

Once a week, Dr. Whiteson brings his rehabilitation expertise to thousands nationwide as the host of a regular Rehab Medicine show on Sirius XM's Doctor Radio. Broadcasting from a booth in the main lobby of NYU Langone Medical Center, Dr. Whiteson is joined by guests—at times a prominent medical expert, at times a patient—to discuss health- and rehab-related topics, from smoking cessation to cancer. "It's a live show, so people call in and we answer questions. I help provide context to the health information people may be getting in the news, topics like lifestyle changes or the childhood obesity epidemic. When I sit down in my office with a patient, it's one-on-one, but when I'm on the radio, I'm reaching thousands of people. It's powerful, because we can provide medical expertise that really makes a difference for many."

"We'll work with the patient's primary care doctor, their cardiologist or pulmonologist, and their home caregivers to continue shaping their care."

"AMBULATE ME" CAMPAIGN PREVENTING INPATIENT FALLS

Research shows that falls are common among patients in inpatient acute care settings—particularly those with cardiopulmonary conditions, who are more likely to have medically complex comorbid conditions. Some studies have found that over 40 percent of falls among hospitalized patients result in injuries that can have a significant negative effect on long-term health. For this reason, several members of Rusk staff are leading an initiative at NYU Langone called "Ambulate Me," to reduce the incidence of inpatient falls.

The program's interventions are focused on identifying patients who are at increased risk for falls, enhancing awareness of this risk among clinical staff, and instituting practical measures to reduce fall risk. Interventions include holding preventive interdisciplinary safety huddles twice daily; increasing nursing documentation near patient rooms; and using a patient safety alert communication board that identifies patients for close supervision, displays toileting schedules, and shows bed/chair alarms.

So far, the program's successes include a drop in fall rate from third quarter 2013 to fourth quarter 2014, from 6.5 patients to fewer than 4.5 patients per 1,000.

CLINICAL TRANSLATIONAL CARE

Providing Pediatric Care for Body, Mind, and Spirit

PEDIATRIC REHABILITATION

In 2014, Rusk Rehabilitation's CARF-accredited pediatric specialty program completed its first full year in its new, fully equipped facility in the Hospital for Joint Diseases (HJD) at NYU Langone Medical Center, which features the latest rehabilitation technology. The program, renowned for its expertise in handling the most challenging pediatric cases across the spectrum of congenital and acquired conditions, has seen dramatic growth, with weekly volume doubling during this period. In 2015, the outpatient clinic schedule will include Saturday hours, and inpatient child life therapy coverage will be extended to include Sunday hours, to cover the overall patient demand.

Rusk's clinical staff has also initiated unique programs to enhance the quality of patient care. Through an early mobilization initiative, Rusk's clinical staff is working closely with colleagues in orthopaedics to improve the efficiency of discharge planning for pediatric surgical patients, with the goal of getting patients out of the hospital and into outpatient rehabilitation sooner. In 2014, Rusk also kicked off a new outpatient program matching pediatric patients with speech-language disorders and assistive technologies that can improve functioning in school and at home.

The program, which helps to address gaps in resources patients may receive through the New York City Department of Education, draws on Rusk's large "lending library" of assistive technologies, including Magic Arm systems, switches, keyboards, and tracker balls and pads; patients receive training and can "road-test" devices to determine the best fit.

OUTPATIENT PEDIATRIC VOLUME — FISCAL YEAR 2014

- Physical Therapy: 9,844
- Occupational Therapy: 6,123
- Speech Language: 1,361
- Psychology: 710

UNMATCHED FACILITIES

The HJD facility is specially equipped and designed to serve the rehabilitation needs of a broad range of pediatric patients from birth to age 21, including postsurgical patients. "Both inpatient and outpatient units were designed to provide an extremely positive patient experience in terms of their environment, while at the same time promoting a fluid delivery of services across every discipline," notes Renat Sukhov, MD, associate professor of rehabilitation medicine and associate medical director of Rusk's Pediatric Rehabilitation Service.

FACILITY FEATURES

- 16 inpatient beds
- large recreational room
- family rooms
- technologically advanced therapy gym

ADVANCED EQUIPMENT AND TECHNOLOGY

- Aqua therapy pool
- DynavisionTM
- Lokomat®
- LiteGait®
- RT-300
- SaeboFlex
- Bioness®, L300, L300plus, and H200
- Motomed®
- Armeo®Spring

MOTIVATED STAFF, UNIQUE PROGRAMS

In 2014, the pediatric rehabilitation unit received funding for several proposals for pediatric care programs, each developed by a Rusk clinician. The programs, funded by grants from KiDS of NYU Langone, a philanthropy that supports pediatric care at NYU Langone Medical Center, vary in goals from encouraging healthy eating to promoting participation in sports. "Each grant meets a specific need, beyond what hospitals are normally equipped to do," explains Carie K. Sumida, PT, DPT, supervisor of pediatric physical therapy. "Not only are these grants wonderful for patients, but the application process offers a great chance for our clinicians to crystallize their ideas."

INNOVATIVE PROGRAMS ENHANCE PEDIATRIC REHABILITATION

FAMILY-CENTERED EDUCATIONAL PROGRAM ON PHYSICAL THERAPY AND EXERCISE TO PROMOTE WELLNESS

Tailored for families of pediatric patients with cystic fibrosis and childhood cancer, this program provides education and encouragement for patients to engage in safe exercise.

HEALTHY EATING, ACTIVE LIVING (HEAL)

This weekly cooking class and educational program for pediatric patients and parents/caregivers is designed to promote healthy eating and includes training in the use of adaptive utensils.

SMILES THROUGH SPORTS (ADAPTIVE SPORTS FOR REHAB INPATIENTS)

Rusk staff are trained in adaptive equipment for basketball, volleyball, yoga, and tennis, and help patients find opportunities to continue these sports upon discharge.

ADAPTIVE SKI/SNOWBOARD PROGRAM

This program funds an adaptive skiing and snowboarding excursion for ten children, including instruction from trained and certified ski/snowboard instructors.

IN THE KNOW

Weekly education sessions arm parents and caregivers with the tools to care for their child with a newly acquired brain injury. Topics include: training on safe transfers, increasing independence in self-care tasks, education on cognitive remediation skills, and introduction to community resources.

INTEGRATIVE HEALTH SERVICES

To help alleviate the anxiety, stress, insomnia and other symptoms that often accompany an inpatient stay, the Goldman Sachs Dehnert Family Pediatric Rehabilitation Integrative Health Program provides free holistic care in the form of relaxation techniques, REIKI, adaptive yoga, meditation, massage, and guided imagery to patients and families or caregivers.

CAMP HIGH-FIVE PROVIDES SETTING TO ASSESS CONSTRAINED MOVEMENT THERAPY

For the past six years, Rusk's Camp High-Five has provided constrained movement therapy in a setting promoting multisensory activities. Horticultural therapy, arts and crafts, and cooking are used to entice groups of children with like conditions to use their weak side to improve function and grasp.

In 2014, Camp High-Five enrollment criteria were tightened to include only children with hemiparesis from cerebral palsy or brain injury, so Rusk researchers can track campers' functional gains for objective evidence that the intervention is working. "While Camp High-Five has always produced good anecdotal results, for the camp to be truly valuable, we need to accurately monitor its therapeutic outcomes," notes Sumida.

In order to do this, clinical staff members are now conducting an Assisting Hand Assessment at the start and end of the camp session. This tool provides a calibrated evaluation of hand function, allowing therapists to carefully measure campers' progress. Results go into a database for later analysis, and will be used to inform the camp's future design. Preliminary data appear promising, with most campers showing significant improvement in the use of their affected hands.

CLINICAL TRANSLATIONAL CARE

A Long History of Expertise in Spinal Cord Injury Rehabilitation

SPINAL CORD INJURY

Rehabilitation medicine was pioneered at Rusk in the 1950s—then, the Institute for Rehabilitation Medicine—spurred on by the needs of veterans of World War II with complex spinal cord injuries. This historical context is the foundation of Rusk's continued international reputation as a center of clinical excellence and leading research in spinal cord injury.

ONE OF FIVE CLINICAL TRIAL SITES FOR INDEGO® EXOSKELETON

Rusk was selected as one of five U.S. centers conducting clinical research on the Indego® Exoskeleton Powered Limb Device, a 27-pound, battery-powered exoskeleton designed to help patients recover limb movement and control. Indego® contains motors that move the hip and knee joints, and uses functional electrical stimulation to contract muscles. Sensors allow Indego® to vary the degree of robotic assistance and adjust to the user's position, movements, and level of function.

The study will evaluate the Indego® device for safety and effectiveness at allowing individuals who are paraplegic as a result of spinal cord injury to stand up and mobilize in a variety of situations. Under the study protocol, a team of specially trained physical therapists will work with each patient in the use of the exoskeleton. Over a period of eight weeks, participants will be taught to stand up and walk under various conditions—on indoor and outdoor surfaces, in elevators, while managing doorways, at different seat heights, and during extended distances. The training sessions will be adapted according to each patient's learning styles and abilities. At the end of the study, researchers will report on both the device's overall effectiveness in allowing paraplegic patients to mobilize, and the strengths and weaknesses of the device as it is assessed under study conditions.

Tamara Bushnik, PhD, FACRM, associate professor of rehabilitation medicine and director of research at Rusk Rehabilitation, is leading the research. Two Rusk patients are currently enrolled in the trial, which is sponsored by the device manufacturer, Parker Hannifin Corporation.

EXTENSIVE VOCATIONAL REHABILITATION CAPABILITIES

Rusk Rehabilitation's commitment to helping spinal cord injury patients return to independent living in the community also includes support for workforce reentry. Rusk's Vocational Rehabilitation Program, which includes job placement, vocational counseling, evaluation, and training services, is one of the largest in the region, with seven vocational rehabilitation counselors and one dedicated computer instructor. For patients with spinal cord injuries, computer training includes customized interfaces, such as the voice recognition program Dragon® NaturallySpeaking, and instruction in Microsoft Office programs specifically tailored to individual needs and capabilities.

Vocational Rehabilitation Client Stats

2014

550	20	50	60%
referrals	individuals with spinal cord injury	job placement clients	successfully placed in jobs

BREADTH AND DEPTH OF EXPERTISE

Rusk's multidisciplinary spinal cord service is led by Jung Hwan Ahn, MD, professor of rehabilitation medicine, who has over three decades of experience treating spinal cord injuries. "I coordinate not only the functional therapy but also the medical and surgical issues for my patients during their acute inpatient rehabilitation," notes Dr. Ahn. "Treating patients with spinal cord injury requires understanding not only their functional losses and psychosocial impacts, but the anatomical, physiological, and medical aspects of their condition as well."

While spinal cord injury rehabilitation may begin in the inpatient setting, it seldom ends there. Rusk Rehabilitation provides a comprehensive program of outpatient rehabilitation, aimed at helping patients regain function so that they can live independently in the community. Rusk Rehabilitation outpatient services include interfacing with homecare providers to address the special needs of patients, driver rehabilitation, which includes a driving simulator to assess perceptual and physical abilities, as well as consultation in barrier-free design for patients who need to draft home renovation plans that ensure safety and comfort.

"Treating patients with spinal cord injury requires understanding not only their functional losses and psychosocial impacts, but the anatomical, physiological, and medical aspects of their condition as well."

77
inpatients
in 2014

CLINICAL TRANSLATIONAL CARE

Experts in Recovery After a Stroke

STROKE REHABILITATION

Rusk Rehabilitation was one of the first stroke rehabilitation programs in the United States to earn CARF accreditation as an Inpatient Stroke Rehabilitation Specialty Program, a credential that it continues to maintain at the highest level.

Recent years have seen extraordinary advances in stroke rehabilitation, driven by improved understanding of the neuronal recovery process. Rusk Rehabilitation is on the forefront of these advances as a recognized leader in the delivery of cutting-edge therapies, some of them developed by NYU Langone researchers themselves.

BECOMING "FIT" AGAIN AT THE MOTOR RECOVERY RESEARCH LABORATORY

Rusk's Motor Recovery Research Laboratory researchers are currently working on a prestigious five-year $3.4 million R01 National Institutes of Health (NIH) research grant to develop an innovative approach to fine motor rehabilitation. The grant builds on research that Preeti Raghavan, MD, assistant professor of rehabilitation medicine and lab director, and her team, have done to better understand how stroke affects fine motor muscle control.

Their work has led to development of a patented rehabilitation tool called the Finger Independence Trainer (FIT), which is now being tested. To use the FIT, the patient inserts both hands into individualized finger slots. When the functioning hand is opened, the affected hand's fingers are automatically extended in an identical motion. "FIT trains the brain," notes Dr. Raghavan, a 2014 NYC Regional Innovation Node Cohort Participant for her work on fine motor rehabilitation in stroke patients. "Moving the unaffected side sends sensory information to both hemispheres, stimulating new connections in the neural network controlling the affected hand."

A MULTISENSORY APPROACH

Rusk's Visuomotor Integration Laboratory, led by John-Ross Rizzo, MD, assistant professor of rehabilitation medicine, is investigating how tactile feedback affects the way a stroke patient adapts grip force to surface friction—research that may lead to approaches for improving their tactile sensation and fine motor control. Dr. Rizzo is also leading a two-year grant from the National Institute on Aging to study the use of vision therapy to improve hand function after stroke. His team is developing visual rehabilitation exercises for use on the iPad.

Another sensory-based project at the Motor Recovery Research Laboratory is examining how auditory constraints affect motor learning during different stages of stroke recovery, and what implications this may have for developing personalized post-stroke treatment algorithms.

REHABILITATION TECHNOLOGIES ENCOURAGE NEUROPLASTICITY

Among the latest motor recovery technologies Rusk is applying to the treatment of stroke patients are those that encourage neuroplasticity by working or stimulating the affected side. These include ReoGo™, a robot-assisted rehabilitation system that uses repetitive motion to assist patients in regaining upper body strength and range of motion, and Neuromove™, a computerized neurological relearning tool that senses the patient's attempts to move muscles and rewards these attempts by stimulating muscular contractions.

TUNING UP MOTOR RECOVERY WITH MUSIC AND MOVEMENT

Motor Recovery Research Laboratory researchers have teamed up with music therapists to create an intervention called Music Upper Limb Therapy Integrated (MULTI), which provides upper-limb therapy and music therapy simultaneously to stroke rehabilitation patients. The participants joined in music-making activities to facilitate upper-limb movements such as reaching, grasp/release, and dexterity. A six-week MULTI pilot study showed dramatic improvements in hand function, with evidence of continued long-term benefits at one year. In follow-up interviews one year later, several participants reported continued improvement in function, including self-care tasks, recreational activities, and computer use. A National Institutes of Health (NIH) grant is currently pending to conduct a larger, controlled study of MULTI.

MUSIC UPPER LIMB THERAPY INTEGRATED (MULTI) PILOT STUDY

Key Findings

- Significant reduction in motor impairment on Fugl-Meyer Scale ($P=0.002$)
- Improvement in sensory perception and discrimination measured by two-point discrimination test ($P=0.004$)

Conclusion

- Enriched rehabilitation protocols such as MULTI that address physical and psychosocial domains of impairment simultaneously may be a promising solution to enhance and improve access to rehabilitation post-stroke.

30% increase
in patient volume since April 2014

312 inpatient stroke cases
in 2014

CLINICAL TRANSLATIONAL CARE

Helping Patients Rediscover Function and Independence After Losing a Limb

AMPUTATION

Rusk's limb loss program is known for providing comprehensive clinical care, but it is also founded on an active research program aimed at better understanding the needs of patients and developing innovative approaches to meet those needs.

TRACKING TREATMENT AND OUTCOMES OF LOWER-LIMB AMPUTATION

In 2014, Rusk Rehabilitation began collaborating with the VA NY Harbor Healthcare System on National Institute on Disability and Rehabilitation Research (NIDRR)-funded research to develop a first-of-its-kind regional longitudinal database of civilian and military veteran patients who have undergone lower limb amputation.

According to Jeffrey M. Cohen, MD, professor of rehabilitation medicine and a co-investigator for the study, called STEPS (Studying Treatments and Effectiveness of Prosthetics Services): Utilizing a Regional Collaborative Longitudinal Outcome Database (CLOUD), the goal of the project is to improve treatment and outcomes. "It's focused on helping us develop evidence-based approaches to rehabilitation for lower-limb amputation," says Dr. Cohen. The goal for the study is to gather extensive data on 300 amputee patients from Rusk Rehabilitation and VA NY Harbor Healthcare System. The research team conducts a detailed initial interview to capture demographic data, including work history, education, ethnic/cultural identity, and medical history, and Dr. Cohen performs a comprehensive physical exam, including vascular, neurologic, and functional assessment. There is an extensive follow-up schedule, with regular visits at six months and one year and beyond. During the first year of the three-year project, Dr. Cohen and his team enrolled 69 patients.

HELPING PATIENTS MAKE THE LEAP BACK INTO THE COMMUNITY

Rusk Rehabilitation offers a program of support as a bridge to help amputees re-enter and function in the community. LEAP (Learning and Encouragement for Amputees with and without Prosthetics) offers amputees and their families and friends opportunities to interact with members of their care team and fellow amputees, and provides access to a broad range of support services. These services include monthly support group meetings where amputees can socialize and share their experiences, weekly mobility clinics led by a physical therapist, numerous community social and education events, and peer- support counseling services. Rusk also works closely with the Amputee Coalition, conducting peer mentor training and leading two New York Limb Loss Days in 2014.

LEADING IN AMPUTEE REHABILITATION EDUCATION

Rusk Rehabilitation has long served as a leader in professional education in amputation rehabilitation, and in 2014 hosted its annual 3-day course on prosthetics and orthotics, attracting 43 physicians and physical and occupational therapists from throughout the country. At the 2014 AAPM&R Annual Assembly meeting, Dr. Cohen was the course director for an educational session entitled "Lower Extremity Amputations/Evidence-Based Care and Update on Emerging Lower Extremity Prosthetic Technology," which attracted over 120 participants who learned about the latest technological advances and developments in prosthetics and orthotics.

TECHNOLOGY BRINGS OBJECTIVITY TO PROSTHETIC DEVICE SELECTION

Rusk Rehabilitation researchers are currently working on a project funded by the American Orthotic and Prosthetic Association, using the latest computer technology to develop an evidence-based system for selecting prosthetic devices for lower-limb amputee patients. This study, led by Dr. Jeffrey Cohen (principal investigator), is entitled "Developing an Evidence-Based Approach to Address Functional Level Change in Persons Following Transfemoral Amputation." Currently, lower-limb prosthetic devices are approved by Medicare via subjective assessment of mobility and prediction of the expected mobility level (K-level) to be achieved with a prosthetic device. The difference between getting a K2 or K3 rating can be significant in terms of which device a patient qualifies for. Rusk Rehabilitation researchers want to replace subjective assessment with objective data using the Orthocare StepWatch™ Activity Monitor, a device that captures real-life activity data and transmits it to the Orthocare Galileo, a web-based system that collects and stores this data. The K-level recorded by the Orthocare system will reflect an objective assessment of mobility that better supports clinical decisions and improves treatment outcomes.

CLINICAL TRANSLATIONAL CARE

Changing the Paradigm in the Study and Treatment of the "Invisible Injury"

BRAIN INJURY REHABILITATION

RUSK TBIMS: MAKING BRAIN INJURY A NATIONAL PRIORITY

As a recognized leader in brain injury treatment and research, Rusk serves as 1 of 16 U.S. National Institute on Disability and Rehabilitation Research (NIDRR) Traumatic Brain Injury Model System (TBIMS) centers. The goal of this program is to help build a national database that will improve understanding of how traumatic brain injury (TBI) affects individuals, and to help develop innovative and effective approaches to TBI rehabilitation.

Rusk Rehabilitation has played a pivotal role in the TBIMS, collaborating with institutions throughout the country on a broad range of research projects. In 2013–14, Rusk Rehabilitation researchers authored six TBIMS publications and/or presentations at major meetings. In the spring of 2014, Tamara Bushnik, PhD, FACRM, associate professor of rehabilitation medicine, director of research at Rusk Rehabilitation, and past president and member of the board of governors of the American Congress of Rehabilitation Medicine (ACRM), along with Brian Im, MD, assistant professor of rehabilitation medicine and co-director of the Inpatient Brain Injury Rehabilitation Program, delivered their findings on the relationship between urban homelessness and TBI at the annual meeting of the ACRM. Their findings have indicated that the rates of homelessness in the New York City Bellevue Hospital Center TBI population are higher as compared to those recorded by the national model systems database. Homelessness in this urban population increases risk for adverse health outcomes, and makes successful reintegration into the community more difficult.

At the 2014 Annual Meeting of the American Psychological Association, Joseph F. Rath, PhD, clinical assistant professor in psychology and rehabilitation medicine, and Dr. Bushnik presented results on TBI rehabilitation in the urban setting, examining the effect of race and socioeconomic status on access to care. Rusk Rehabilitation TBIMS researchers are also examining topics including the effectiveness of interventions for fatigue after TBI, the use of the Pittsburgh Sleep Quality Index in persons with TBI, and the effectiveness of the Functional Independence Measure (FIM™) in accurately capturing cognitive changes following TBI. Research on the FIM™ has highlighted important limitations in this widely used assessment tool, supporting the need for developing alternate measures of cognitive function in TBI.

In addition to involvement in the TBIMS program, Rusk Rehabilitation clinicians are collaborating in a range of research projects with colleagues in neurology, neuropsychology, sports medicine, and other disciplines. In one ongoing National Institutes of Health grant, Laura Balcer, MD, MSCE, vice chair of the Department of Neurology and co-director of the Concussion Center; Yvonne Lui, MD, assistant professor of radiology; and William Barr, PhD, associate professor of neurology and psychiatry are developing tools to improve the difficult job of diagnosing concussion.

207
inpatients

SERVING INDIVIDUALS WITH BRAIN INJURY, FROM THE HOSPITAL TO THE COMMUNITY

Led by three attending physicians who specialize in brain injury rehabilitation, two of whom are fellowship-trained, Rusk is one of a select few institutions able to treat the full spectrum of brain injuries, providing continuity of care that spans inpatient and outpatient services. "We can handle patients who are in a coma, as well as those who have suffered only a mild concussion," notes Dr. Im, co-director of Rusk's Brain Injury Rehabilitation program, including their CARF-accredited acute inpatient rehabilitation unit. "Inpatient care is only one part of the recovery process. When you leave the inpatient unit, you still have a lot of needs, both in terms of cognitive-behavioral and physical functioning. Our goal is to address all of these needs and get our patients back into the community."

Rusk offers comprehensive clinical services that help patients regain function and make that return to the community. For instance, the speech-language pathology program provides a complete spectrum of services for aphasia, including evaluations, individual and group treatment, community support groups, family education, and training in alternative communication systems—all designed to help patients regain the ability to communicate in their daily lives.

CLINICAL TRANSLATIONAL CARE

COORDINATED, COMPREHENSIVE CARE AT THE NYU LANGONE CONCUSSION CENTER

Concussion continues to be a significant focal point in the public eye, as well as in the scientific and medical community. With some of the country's top experts in rehabilitation, neurology, and orthopaedics, NYU Langone's Concussion Center is uniquely positioned to lead the way in the treatment and study of this challenging injury. The center has gained national prominence by pioneering a multidisciplinary approach to concussion treatment and rehabilitation that brings together the skills of clinical staff from a variety of specialties. The center is unique in that it is managed by a clinician—in fact, a registered nurse with 18-plus years of experience in rehabilitation—who helps coordinate each patient's care, explaining treatment and guiding them through their appointments with the multidisciplinary team.

The Concussion Center is led by co-directors in neurology, sports medicine, and rehabilitation medicine. Dennis A. Cardone, DO, associate professor of orthopaedic surgery and chief of the Sports Medicine Division in the Department of Orthopaedic Surgery at NYU Langone, and one of three co-directors, notes: "There are very few models like that out there... It's about bringing the disciplines together to treat individuals with concussion." Initial evaluations are often led by a physiatrist, but the center is set up to move patients seamlessly across departments and specialties as needed, including neurology, neurosurgery, physical medicine and rehabilitation, sports medicine, neuroradiology, neuropsychology, and occupational and physical therapy.

The Concussion Center is committed to improving concussion treatment through research, education, and community outreach. In August 2013, the Concussion Center started a first-of-its-kind concussion registry, designed to collect data that will improve understanding and treatment of concussion. To date, the Concussion Center registry has gathered data on 600 patients. The Concussion Center is also taking a leading national role in concussion education for clinical professionals. In 2014, the center sponsored its first annual CME course on Concussion in Sports, an event that attracted 350 participants from throughout the United States. Concussion Center clinical staff members take part in numerous community forums devoted to concussion awareness and education, including workshops for coaches and parents of young athletes. As part of its launch in 2013, the center sponsored the community educational symposium "Head Injuries and Concussion in Sports: What You Need to Know," which attracted 145 participants and garnered national headlines.

CONCUSSION CENTER LEADERSHIP

Center Co-Director Laura J. Balcer, MD, MSCE, professor and vice chair of the Department of Neurology at NYU Langone Medical Center. A neurologist and epidemiologist, Dr. Balcer is a co-leader of national collaborative clinical and research efforts in the neuro-ophthalmology of multiple sclerosis and sports-related concussion.

Center Co-Director Dennis A. Cardone, DO, is a fellowship-trained and board-certified specialist in pediatric and adult sports medicine, and an associate professor of orthopaedic surgery and chief of the Primary Care Sports Medicine Division in the Department of Orthopaedic Surgery.

Center Co-Director Steven R. Flanagan, MD, the Howard A. Rusk Professor of Rehabilitation Medicine, chair of the Department of Rehabilitation Medicine, and medical director of Rusk Rehabilitation, is an internationally recognized expert in traumatic brain injury and brain injury rehabilitation.

Program Manager Mara F. Sproul, RN, is a registered nurse with over 18 years of experience in rehabilitation, pediatrics, geriatrics, cardiology, and nursing administration. Ms. Sproul serves a role that is unique to NYU Langone's Concussion Center: She is the primary point of contact for all patients, offering expert clinical guidance and coordinating their care as they are seen by different specialists.

established in 2013	1,333 patients	350 attendees
	total referrals/appointments through the first 18 months of operation	at first annual Concussion in Sports CME

CLINICAL TRANSLATIONAL CARE

An Integrative Approach to Sports Medicine

MUSCULOSKELETAL AND SPORTS MEDICINE

In a field where the ability to draw from different specialty areas can mean life-altering pain relief for patients, the dual-certification of Rusk's team of sports rehabilitation physicians uniquely positions them to do so. Led by Alex Moroz, MD, and Wayne Stokes, MD, both of whom hold dual board certifications in physiatry and sports medicine, Rusk recently added three new physicians who have the same goals to deliver well-rounded patient care.

Charles Kim, MD, assistant professor of rehabilitation medicine and anesthesiology, and Kimberly A. Sackheim, DO, assistant professor of rehabilitation medicine, are dual certified in both physiatry and pain medicine. Salvador E. Portugal, DO, also brings an advanced level of expertise, with dual certifications in physical medicine and rehabilitation (PM&R) and sports medicine.

Rusk's well-rounded team is ideally positioned to offer a complete range of traditional and integrative treatments.

"When I'm treating a patient, I will use all of the interventions that can help at the same time, including medications, exercise, physical modalities, injections, acupuncture, as well as meditation and stress reduction," says Dr. Moroz. Dr. Moroz, like new faculty member Dr. Kim, is a certified acupuncturist, and often performs acupuncture treatments himself. Additionally, Rusk is a site for an Academic Acupuncture Externship, and in collaboration with New York City's Tri-State College of Acupuncture, recently added an acupuncture track to its Accreditation Council for Graduate Medical Education (ACGME)-accredited PM&R residency program.

NYU Langone is the only medical center in New York to have all of its musculoskeletal specialties—orthopaedics, rheumatology, and rehabilitation medicine—ranked top 10 in *U.S. News & World Report's* national "Best Hospitals" lists.

A COLLABORATIVE SETTING FOR CARE

Rusk's sports rehabilitation takes place largely at NYU Langone's Center for Musculoskeletal Care (CMC), one of the largest outpatient facilities of its kind in the nation. The unique setting, which opened in 2012, enables a high level of collaboration between Rusk clinicians and NYU Langone's top-ranked orthopaedists, rheumatologists, and physiatrists. Having these exceptional resources under a single roof provides patients with the best possible care in one convenient setting. The musculoskeletal and sports medicine program has over a dozen experienced physical therapists, four of whom are dual-certified in sports and orthopaedic medicine. "The vision for Rusk at CMC was seamless, comprehensive care," says Dr. Moroz. "It is exciting to see how that has come to life."

This vision of comprehensive care extends to community outreach. In 2014, Rusk Rehabilitation collaborated with the Department of Orthopaedic Surgery at NYU Langone on 13 public education lectures on topics ranging from preventing injury when training for a triathlon to the mind-body link in chronic pain. The lectures attracted over 300 attendees and helped fulfill Rusk's ongoing mission to provide life-enhancing health education to the public.

Similarly, Rusk plays an important role nationally in educating physicians and other care providers. In 2014, it started an ACGME-accredited fellowship program in sports medicine, joining a select list of only 16 institutions in the United States that offer such a PM&R-based fellowship.

KEEPING ATHLETES AND PERFORMERS AT THE TOP OF THEIR GAME

Rusk is on the sidelines and backstage providing care for athletes and performers at every level. Whether professional athletes from teams in the New York area, participants in the U.S. Open Tennis Tournament, dancers from the Alvin Ailey Dance Theater, or ordinary "weekend warriors," Rusk clinicians have the expertise to handle the entire spectrum of sports-related injuries and recurrent conditions. "I've treated every type of athlete, from the pro skier to the 75-year-old fitness walker," says Dr. Stokes. "Rusk's sports medicine program has the best diagnostic equipment, the best rehabilitation gym, and the best physical therapists. Whatever the injury, we get our patients healthy and back to their favorite activity."

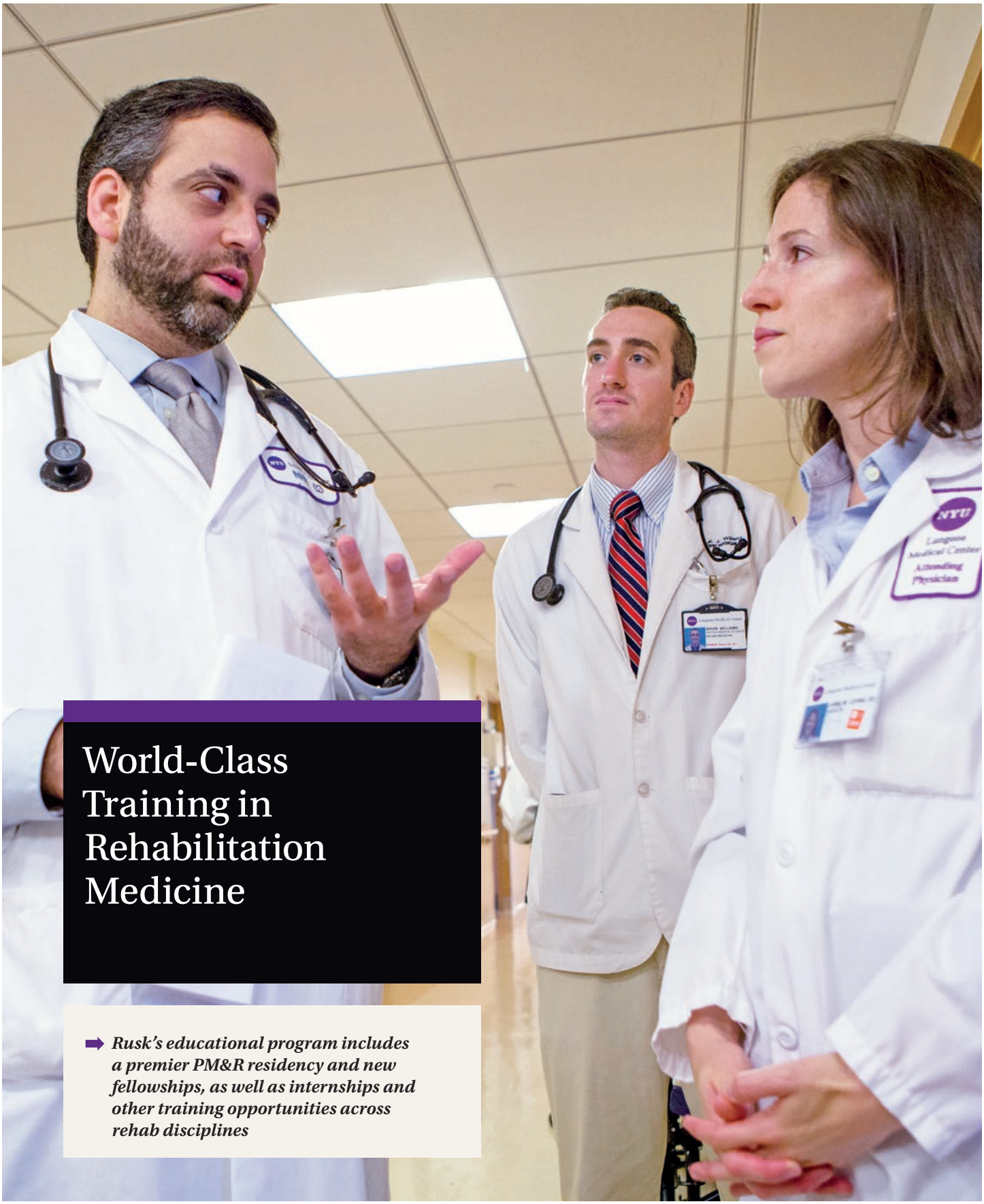
THE LATEST TECHNOLOGY FOR TREATMENT AND TRAINING

CMC musculoskeletal radiologists use state-of-the art imaging technology, including ultra-low-dose radiation EOS® imaging equipment that provides three-dimensional, full-body digital scans. Physical and occupational therapy is carried out in the center's 7,200 square-foot therapy gym, with a broad spectrum of rehabilitation equipment, including:

- Cybex resistance and cardiovascular equipment
- Advanced Pilates Reformer equipment
- Alter-G Anti-Gravity treadmills, incorporating the same technology NASA uses to train its astronauts
- Shuttle MVP Pro plyometric trainers for the rehabilitation of athletes who engage in high-level sports
- Woodway high-performance treadmills, with increased shock absorption
- Chattanooga Triton DTS advanced traction system for cervical and lumbar spine conditions
- Real-time ultrasound imaging biofeedback tools for neuromuscular re-education
- Cold laser treatment for muscle strains, joint sprains, tendinitis, and overuse injuries
- Game Ready injury treatment system, combining cryotherapy with compression to reduce swelling
- Dryland swimming machines that allow users to train out of the water

In addition to treating sports-related injuries, the CMC offers services to athletes who want to take their skills to the next level, within the Sports Performance Center. In this center, which includes a specialized program for runners that was featured in *Runner's World*, teams of clinicians prescribe custom-tailored, individualized training regimens based on a thorough analysis that includes video review of the biomechanics of sports-specific movements such as a golf swing, tennis stroke, or soccer kick.

EDUCATION & TRAINING



World-Class Training in Rehabilitation Medicine

➡ ***Rusk's educational program includes a premier PM&R residency and new fellowships, as well as internships and other training opportunities across rehab disciplines***

PM&R Residency

One of the most renowned physical medicine and rehabilitation (PM&R) residency programs in the world and the largest of its kind in the United States, the three-year PM&R residency at Rusk Rehabilitation is fully accredited by the Accreditation Council for Graduate Medical Education, and continues to attract top-caliber residents year after year.

In 2014, a total of 41 residents received training, with clinical rotations encompassing a broad range of subspecialties, including electromyography and orthotics, prosthetics, and bionic medicine.

Rusk's focus on research was apparent in its educational offerings, too, as 2014 marked the first year in which the Rusk Rehabilitation residency program had a mandatory research requirement. Resident trainees engaged in a variety of research projects, including "Developing an Evidence-Based Approach to Address Functional Level Change in Persons Following Transfemoral Amputation (TFA)" and "Pelvic Floor Dysfunction in Female Rowers."

UPCOMING CME EVENTS

- **Concussion in Sports CME**
  February 27, 2015
- **Comprehensive Review of PM&R**
  March 23-28, 2015

PAST CME EVENTS AND AAPM&R COURSES

- **Comprehensive Review of PM&R**
  March 24–29, 2014
  (278 attendees, in person and online)
- **Annual Course on Orthotics and Prosthetics**
  February 12–14, 2014 (43 attendees)
- **First Annual CME Course on Concussion in Sports**
  February 28, 2014 (350 attendees)

For more information, go to **nyulmc.org/cme**

PM&R Fellowships

Rusk's accredited, year-long brain injury medicine and sports medicine fellowships are now under way, and its two-year pediatric rehabilitation fellowship will begin in the summer of 2015.

Both the brain injury medicine and sports medicine fellowships are year-long programs that provide rigorous clinical training. The brain injury medicine fellowship is one of just three accredited brain injury fellowship programs in the United States, and the sports medicine fellowship is one of just 16 accredited physical medicine and rehabilitation (PM&R)-based programs in the United States. The sports medicine fellowship provides comprehensive, interdisciplinary musculoskeletal sports medicine training to one fellow each year. Sports medicine fellows provide medical care under the supervision of sports medicine faculty. Alfred Castillo, MD, the 2014 fellow, is serving as team doctor for the athletic programs at St. Joseph's College in Brooklyn, where he is also conducting research on the sideline evaluation of concussions.

Education Across Rehab Disciplines

Rusk Rehabilitation is a leader in education, covering a range of rehabilitation disciplines and specialty areas, including physical and occupational therapy, speech-language pathology, and rehabilitation psychology. Its educational offerings continue to grow and expand, with the recent addition of training opportunities in integrative approaches to rehabilitation.

The clinical psychology internship is a full-time, accredited clinical psychology doctoral internship, the second oldest program of its kind in the United States. In 2014, the program provided training for eight interns. Under a federal grant for $300,000, the clinical psychology program will soon expand to accommodate 10 interns. Additionally, in 2014, Rusk provided training for three graduate student externs enrolled in clinical psychology PhD/PsyD programs.

23 PM&R Chairs

received their residency training at Rusk. Numerous other alumni of the Rusk residency program have gone on to subspecialty fellowships.

Rusk offers internships in occupational therapy, and is affiliated with 23 accredited occupational therapy (OT) programs inside and outside of the State of New York. In 2014, Rusk trained 23 full-time and 32 part-time OT students, a 27 percent increase over the number of trainees for 2013.

Each year, Rusk offers an externship in speech-language pathology to a select number of graduate students. These externs work primarily with patients who have neurogenic communication disorders, but also gain experience working with patients who have received cochlear implants, as well as those being treated for head and neck disorders. Rusk offers an externship in acupuncture in collaboration with New York City's Tri-State College of Acupuncture (T-SCA), one of the oldest acupuncture schools in the United States. Externs work alongside conventional medical providers at NYU Langone to provide acupuncture as a supplement to primary and specialty care. Rusk is also collaborating with the T-SCA to create a unique acupuncture track for residents, which will be implemented in 2015.

The Department of Physical Therapy at Rusk Rehabilitation started a neurological physical therapy residency program in the summer of 2014, and it has since been designated a developing program by the American Physical Therapy Association, on track for accreditation in 2015. The program includes clinical training in acute inpatient and outpatient neurological physical therapy, as well as involvement in clinical research projects at Rusk's Motor Recovery Research Laboratory, and community outreach to promote and raise awareness of neurological physical therapy.

Rusk also offers physical and occupational therapy observational internships, in which interns are able to shadow Rusk therapists.

HISTORY

Rusk History

1946

The Department of Physical Medicine and Rehabilitation (PM&R) at the New York University School of Medicine and New York University Medical Center was established.

1948

A temporary program for the newly formed PM&R department was set up in a loft building on 38th Street between First and Second Avenues while permanent space was constructed on 34th Street.

1950

The Institute of Physical Medicine and Rehabilitation, an 80-bed adult and pediatric inpatient and outpatient rehabilitation facility, opened its newly constructed location at 400 East 34th Street.

1956

Three more floors were added to the institute building to increase the capacity to 145 beds.

1968

Rusk opened a $6.5 million research wing

Howard A. Rusk, MD, regarded as the "father of rehabilitation medicine," founded the Institute of Physical Medicine and Rehabilitation at NYU Medical Center in 1948. Drawing on his experience treating wounded soldiers during World War II, Dr. Rusk's philosophy was that rehabilitation medicine should care for the whole person, not just the physical injury or ailment, but a person's emotional, psychological, and social needs as well.

Paving the Way in Rehabilitation Medicine

As one of the longest established rehabilitation programs in the country, many innovations in the field of rehabilitation medicine have taken place at Rusk:

- actively involving family members in the rehabilitation process
- vocational training for people with disabilities
- staffing certified psychologists and social workers
- treating aphasia
- vestibular therapy for inner ear disorders
- driver's education for disabled individuals
- extensive use of cognitive therapy following brain injuries

"There is a rich legacy here, and we are proud to follow in the course set by Dr. Rusk—one that focuses on the whole person and involves a highly integrated team approach to care."

Steven R. Flanagan, MD

1984

The institute was renamed after its founder, and became the Rusk Institute of Rehabilitation Medicine.

2013

The institute building on 34th Street was closed, and Rusk's phased expansion to multiple state-of-the-art facilities across the NYU Langone campus was completed; the Rusk Institute was renamed Rusk Rehabilitation.

1989

In the release of *U.S. News & World Report's* first "Best Hospitals" list, Rusk ranked No. 1 in New York and in the top 10 in the country. Rusk has remained in those top national positions ever since.

2008

Steven R. Flanagan, MD, was named The Howard A. Rusk Professor of Rehabilitation Medicine and chair of the Department of Rehabilitation Medicine at NYU Langone Medical Center.

2012

No longer defined by one particular location, but as an agile network of clinicians, researchers, and educators advancing rehabilitation medicine at NYU Langone, a major expansion and relocation brought Rusk to multiple locations throughout the NYU Langone campus, where patients needed it most.

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LOCATIONS

(as of December 2014)

1
Ambulatory Care Center
240 East 38th Street
New York, NY

2
NYU Langone Medical Center
Main Campus
550 First Avenue
New York, NY

3
Hospital for Joint Diseases
301 East 17th Street
New York, NY

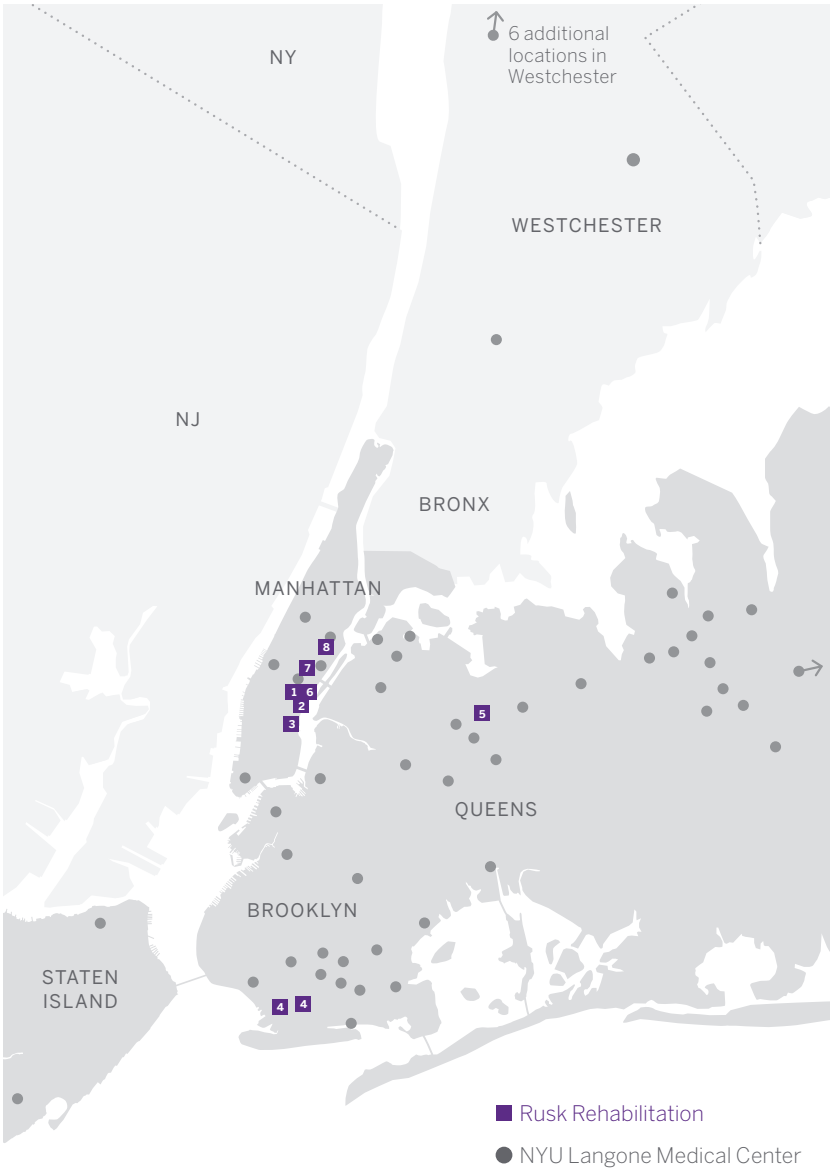
4
Levit Medical (two locations)
1220 Avenue P, Brooklyn, NY
1902 86th Street, Brooklyn, NY

5
Columbus Medical
97-85 Queens Boulevard
Queens, NY

6
Center for
Musculoskeletal Care
333 East 38th Street
New York, NY

7
Preston Robert Tisch Center
for Men's Health
555 Madison Avenue
New York, NY

8
Joan H. Tisch Center
for Women's Health
207 84th Street
New York, NY



LEADERSHIP AND FACULTY

SENIOR LEADERSHIP

STEVEN R. FLANAGAN, MD
Howard A. Rusk Professor of Rehabilitation Medicine;
Chair of the Department of Rehabilitation Medicine;
Medical Director, Rusk Rehabilitation
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Senior Vice President for NYU Langone Medical Center's Hospital for Joint Diseases, Musculoskeletal, and Rusk Rehabilitation

GEOFFREY HALL, MBA, FACHE, LCSW
Department Administrator, Rusk Rehabilitation

CATHERINE PARKIN, DPT
Assistant Professor of Rehabilitation Medicine and Physical Therapy;
Senior Director, Therapy Services

PHYSICIAN LEADERSHIP

JUNG HWAN AHN, MD
Professor of Rehabilitation Medicine;
Associate Director, Rusk Rehabilitation

JONATHAN H. WHITESON, MD
Assistant Professor of Rehabilitation Medicine and Medicine; Director of Rusk Outreach and Growth

ALEX MOROZ, MD
Associate Professor of Rehabilitation Medicine;
Residency Program Director

BRIAN SUNG-HOON IM, MD
Assistant Professor of Rehabilitation Medicine;
Director, Brain Injury, Rusk Rehabilitation

IRA G. RASHBAUM, MD
Professor of Rehabilitation Medicine;
Director, Stroke Rehabiliation

JOAN T. GOLD, MD
Professor of Rehabilitation Medicine;
Director, Pediatric Rehabilitation Program

JEFFREY M. COHEN, MD
Professor of Rehabilitation Medicine;
Director, Medically Complex, Rusk Rehabilitation

RENAT SUKHOV, MD
Associate Professor of Rehabilitation Medicine;
Associate Medical Director, Pediatric Rehabilitation Service

WAYNE STOKES, MD
Associate Professor of Rehabilitation Medicine;
Director, Sports Medicine Rehabilitation

NURSING LEADERSHIP

KIMBERLY S. GLASSMAN, PhD, RN, NEA-BC
Senior Vice President, Patient Care Services & Chief Nursing Officer

NANCY RODENHAUSEN, RN
Vice President, Nursing & Patient Care Services

ANN VANDERBERG, RN
Vice President, Nursing, Hospital for Joint Diseases

MARY ANN LOFTUS, RN
Clinical Director of Nursing Rehabilitation

RUSK PHYSICIANS

AMIT BANSAL, DO
Clinical Instructor

ARTHUR JIMENEZ, MD
Clinical Professor

SIE KIM, MD
Clinical Assistant Professor

VALERY LANYI, MD
Clinical Professor

JAIME LEVINE, DO
Clinical Assistant Professor

WEI ANGELA LIU, MD
Clinical Assistant Professor

SALVADOR E. PORTUGAL, DO
Clinical Instructor

SOFIYA PRILIK, MD
Clinical Instructor

KIMBERLY ANN SACKHEIM, DO
Clinical Assistant Professor

RESEARCH LEADERSHIP

TAMARA BUSHNIK, PhD, FACRM
Associate Professor of Rehabilitation Medicine;
Director, Research, Rusk Rehabilitation

PREETI RAGHAVAN, MD
Assistant Professor of Rehabilitation Medicine;
Director, Motor Recovery Research Laboratory

JOHN-ROSS RIZZO, MD
Assistant Professor of Rehabilitation Medicine;
Director, Visuomotor Integration Laboratory (VMIL);
Director, Technology Translation in Medicine Laboratory (TTML)

CLINICAL AND SITE LEADERSHIP

CARL R. HOOKER, MHA, LSSBB
Director, Operations, Rusk Rehabilitation

JOSEPH RICKER, PhD, ABPP
Professor of Rehabilitation Medicine and Psychiatry;
Director, Psychology, Rusk Rehabilitation

ANGELA M. STOLFI, DPT
Clinical Director, Physical Therapy,
Rusk Rehabilitation

STEVE F. VANLEW, MS, OTR/L
Clinical Director, Occupational Therapy,
Rusk Rehabilitation

ROBERT J. LINDSEY, MA, CRC, LMHC
Director, Vocational Rehabilitation,
Rusk Rehabilitation

MARY R. REILLY, MS, CCC-SLP
Clinical Director, Speech Language Pathology,
Rusk Rehabilitation

JOHN R. CORCORAN, DPT
Assistant Professor of Rehabilitation Medicine;
Site Director, Rusk Rehabilitation, Tisch Hospital

DEBBIE NEWMAN, MA
Site Administrator, Rusk Rehabilitation,
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MARIA CRISTINA TAFURT, MA, OTR/L, ABD
Site Director, Rusk Rehabilitation,
Hospital for Joint Diseases

RHONDA REININGER, MA, OTR
Director, Rehabilitation Compliance,
Rusk Rehabilitation

ORA EZRACHI, PhD
Assistant Professor of Rehabilitation Medicine;
Director, Outcomes Management,
Rusk Rehabilitation

GERALDINE L. PAGNOTTA, MPT, MPH
Director Musculoskeletal Rehabilitation Network,
Rusk Rehabilitation

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LEADERSHIP

NYU LANGONE MEDICAL CENTER
by the numbers*

1,069
Total Number of Beds

77
Operating Rooms

35,666
Patient Admissions

1,061,552
Hospital-Based Outpatient Visits

5,422
Births

2,000,000
Faculty Group Practice
Office Visits

1,408
Full-Time Faculty

1,047
Part-Time Faculty

2,500+
Voluntary Faculty

120
Endowed Professorships

2,515
Physicians

2,953
Registered and Advanced
Practice Nurses

550+
Allied Health Professionals

4,000+
Publications

550,000
Square Feet of Research Space

$245MM
NIH Funding

$285MM
Total Grant Funding

2,053
Inventions

936
US Patents Issued

475
US Patents Licensed

650
MD Candidates

70
MD/PhD Candidates

252
PhD Candidates

415
Postdoctoral Fellows

1,155
Residents and Fellows

*Numbers represent FY14 (Sept 2013–Aug 2014); inventions/patents are cumulative through Aug 31, 2014

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MEDICAL CENTER

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