Changing the lives of people with disabilities

YOUR SUPPORT CHANGES LIVES Impact Report 2017

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Impact Report 2017

Your generosity fuels innovative rehabilitation research and grant making that helps people with disabilities recover function, regain independence, and live to the fullest.

With your support, our research changes care and our grant making links people to job opportunities. Treatments developed by Kessler Foundation scientists are used by rehabilitation professionals in the U.S., Canada, Europe, Australia, Asia, and South America. More than 10,000 individuals with disabilities have been connected to competitive employment.

We could never achieve so much without you. Read more inside about the impact of your support.

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Thank you!

YOUR SUPPORT HELPS PEOPLE REGAIN MOBILITY

With your support, Kessler Foundation's Human Performance and Engineering Research team has flourished. Under the direction of Guang Yue, PhD, experts in biomechanics, bioengineering, movement analysis, robotics, neurophysiology, and neuroimaging seek new and effective ways to improve mobility and motor function so individuals with disabilities can participate fully in school, work, and community activities. **Their efforts fuel innovative approaches to address disabling conditions, including brain injury, spinal cord injury, multiple sclerosis, cerebral palsy, arthritis, and cancer.**



Kessler Foundation's Human Performance and Engineering Research team

Moving Robotics into Clinical Care

Kessler Foundation has led translational research in robotic exoskeletons, influencing the transition of these devices from the lab to rehab facilities and the community. Since the first pilot study of the Ekso in 2011 by Gail Forrest, PT, PhD, the Foundation has actively studied the impact of exo-assisted walking in individuals with spinal cord injury. The Foundation's robotics research focuses on minimizing complications that affect quality of life, including loss of bowel and bladder function, chronic pain, muscle weakness, and bone loss.

The initial exploration of exoskeletons for stroke rehabilitation was conducted in patients at Kessler Institute. Led by Karen Nolan, PhD, this research demonstrates the potential for these devices to transform physical rehabilitation and improve outcomes. Most recently, Dr. Nolan has adapted this line of research to the rehabilitation of adolescents with brain injury, in collaboration with Children's Specialized Hospital and supported by the Reitman Foundation.



The moment when someone disabled by an injury takes his or her first steps using a robotic exoskeleton—that's when I'm most inspired.

—Gail Forrest, PT, PhD, associate director of Human Performance and Engineering Research

Addressing the Needs of Children with Disabilities

Manual wheelchairs mean mobility for many people with disabilities, but daily use strains users' wrists, shoulders, elbows, and neck. Under the leadership of Peter Barrance, PhD, researchers are studying ways to lessen the stresses for young wheelchair users, an area where little research has been done. In collaboration with Children's Specialized Hospital, they are analyzing the pros and cons of standard and ultralight wheelchairs. Building this evidence base will help establish guidelines for the selection and safe long-term use of this critical means of mobility. Providing objective evidence for insurance companies will enable more children to get the equipment they need.



Robotics therapy is revolutionizing rehabilitation. Instead of individuals taking two-dozen strenuous steps in an hour-long therapy session, they can take 300 steps. The feeling of a regular walking pattern helps the brain connect to the motion. Our research explores how we get that change to stick.

—Karen Nolan, PhD, senior research scientist, Human Performance and Engineering Research



Researchers are studying ways to lessen the stresses for young wheelchair users.

Giving Back After a Spinal Cord Injury

Rosalie Hannigan, an active mother of young children, went on a family vacation at the Jersey Shore to take a much-needed break from her busy banking job in New York City. While body surfing, Rosalie tumbled in the waves and broke her neck. She was immediately paralyzed.

Rosalie couldn't walk, she couldn't stand, she couldn't return to work, and she couldn't do many things she once did with her family. But she couldn't—and wouldn't—let her disability hold her down.

Rosalie wanted to regain her independence and learn more about her injury. She joined Kessler Foundation's study to assess a robotic exoskeleton that enables people in wheelchairs to stand and walk.

Participating in these studies has helped me to focus on what I can do. I figured out how to adapt, so that I can take care of myself and my family. Rosalie hopes that walking in the exoskeleton will help her regain strength, and improve her balance and ability to walk independently.

Rosalie has participated in seven Kessler Foundation research studies so far, and plans to do even more.

These days Rosalie can walk up and down stairs, volunteer at her kids' schools, go camping with her family, and take her children to water parks and after-school activities. As a way of giving back, Rosalie not only participates in research, she also raises funds for Kessler Foundation.



-Rosalie Hannigan

YOUR SUPPORT HELPS STROKE SURVIVORS RECLAIM THEIR LIVES

Recovery from stroke can mean overcoming a range of different deficits. Stroke rehabilitation research at Kessler Foundation, led by AM Barrett, MD, addresses the spectrum of challenges faced by stroke survivors. **By closely collaborating with clinicians, advances in research are improving rehabilitative care after stroke.**



AM Barrett, MD, director of Stroke Rehabilitation Research

Spotlighting Hidden Disabilities

Because of your support, more health professionals are implementing the tools developed at Kessler Foundation to detect and treat spatial neglect, a hidden disability that complicates recovery. Even after mild strokes, spatial neglect can be disabling, causing difficulties with self-care, driving, reading, and navigating one's surroundings. Individuals with spatial neglect have an increased risk for falls and prolonged hospital stays, and are less likely to return home. Using the Kessler Foundation Neglect Assessment Process (KF-NAP[™]), clinicians are screening patients for spatial neglect. Those diagnosed with this hidden disability receive the Kessler Foundation Prism Adaptation Treatment (KF-PAT[™]), a noninvasive, cost-effective behavioral therapy using prism goggles.

As more professionals incorporate KF-NAP[™] and KF-PAT[™]—used in seven countries so far—in their rehabilitation protocols, more stroke survivors will attain optimal recovery and greater independence.

Exploring Reading Difficulties

Another cause of disability after stroke is the inability to read. Despite the implications, few studies have focused on the cognitive components of reading impairment. Our researchers, in collaboration with their Rutgers colleagues, are using neuroimaging techniques, neurological examination, and neuropsychological testing to determine the cognitive mechanisms that underlie our ability to read. Led by Olga Boukrina, PhD, the team has correlated specific reading deficits with the location of brain lesions among left-brain stroke survivors. **Based on these findings, new interventions can be developed that will restore the ability to read.**



Olga Boukrina, PhD, research scientist

Life After Stroke

Audrey Cebulski, a retired real estate agent, mother, grandmother, and great grandmother, always believed in hard work, independence, and being active. At 80, Audrey completed a 5K race with her family by her side. Two years later, a severe stroke changed her life. The woman who valued her independence could not take care of herself. She had weakness on her left side and spatial neglect. Because of your support, Audrey received the Kessler Foundation Prism Adaptation Treatment and overcame her spatial neglect and reclaimed her independence.



YOUR SUPPORT IMPROVES THINKING, LEARNING, AND MEMORY

Groundbreaking memory research led by Nancy Chiaravalloti, PhD, uncovered the underlying mechanisms for deficits that cause disability in MS and TBI. Dr. Chiaravalloti and her team of scientists then provided the first evidence for an effective treatment for memory retraining, the modified Story Memory Technique (mSMT), a low-cost, noninvasive cognitive intervention being used in eight countries, and in centers across the U.S.



Nancy Chiaravalloti, PhD, director of Neuropsychology, Neuroscience, and Traumatic Brain Injury Research

The mSMT has been translated into Spanish, Italian, and Chinese. **Using the mSMT's five-week protocol, professionals are helping individuals achieve lasting benefits, including improvements in their ability to perform everyday activities.**

Expanding in New Directions

Now, we are exploring cognitive issues in people with spinal cord injury. Although cognitive deficits contribute to poor rehabilitation outcomes, little attention has focused on changes in cognition in these individuals. We are studying cognitive performance and using neuroimaging to look at possible causes. Ongoing research will determine optimal ways to improve outcomes.

Besides memory problems, scientists seek ways to help people with MS and TBI overcome fatigue, depression, sleep disturbances, personality changes, and difficulty relating to others.

Learning to Live with MS

Your generosity has helped Carla learn to live with multiple sclerosis (MS) and lead a fulfilling life with her son Joseph. Carla was diagnosed in 1997, before Joseph was born. Since then, Carla's MS has advanced significantly. She uses a walker to get around and struggles with memory, communication, and attention problems.

Carla joined an innovative study at Kessler Foundation, led by Helen Genova, PhD. Three times a week for ten weeks, Carla performed exercises in a pool to improve walking, strength, and balance. Dr. Genova is assessing how this program benefits people with MS physically and cognitively. "This study increased my physical stamina and helped my thought process," explained Carla. "MS takes away a lot, but I believe that through research and therapy, we can adapt. When new research discoveries are provided to us, we can have a better quality of life."



With the help of Kessler Foundation and its donors, I'm expanding my abilities and have more time to focus on what I love most—being a mom.

—Carla

Reclaiming Life and Motherhood After TBI

Tracy Matos was driving when her car slid on a patch of black ice and crashed into a utility pole—she was 8 ½ months pregnant. Tracy sustained a severe traumatic brain injury. The outlook was grim. Doctors fought for her life, and for the life of her baby.

After her accident, Tracy was in a coma. Doctors performed an emergency C-section, and, thankfully, her son, Ethan, was born alive and well. Tracy missed his first breath.



Twenty-one days later, Tracy woke to face a new reality. Because of her brain injury, she could not do the simple things so many of us take for granted walking, sitting, eating, talking, and remembering. She couldn't even remember her own name.

Her husband, Mike, and her family worried that she could never care for herself again, let alone be a mother to Ethan and their teenage daughter, Jenna. Returning to her job or continuing her education seemed out of the question. But that all changed, thanks to Kessler Foundation's innovative research—made possible by the support of donors like you.

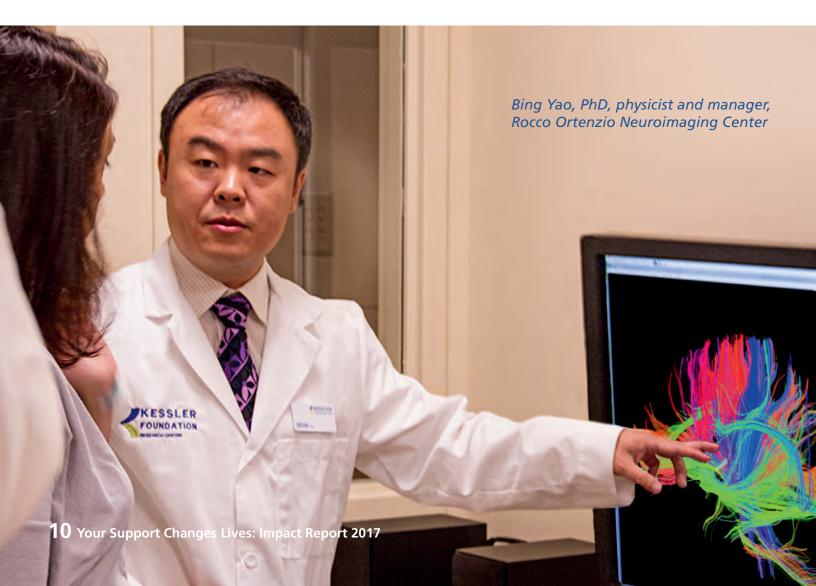
Tracy joined a study to test the modified Story Memory Technique (mSMT). The impact was profound; it helped Tracy get her life back. Just 16 months after her accident, Tracy returned to her job at New Jersey City University, and resumed classes for her master's degree.

Tracy has watched Ethan grow happy and healthy, and Jenna start her college years. Just like any other mother, Tracy takes pride in caring and providing for her family. "My family and I are thankful every day that Kessler Foundation and supporters like you were there after my traumatic brain injury," says Tracy. "Because of you, many others like me are back at home and in their communities, enjoying time with families, friends, and co-workers."



YOUR SUPPORT JUMPSTARTS INNOVATION

Researchers conducted 243 scans at the Rocco Ortenzio Neuroimaging Center at Kessler Foundation last year. Established with the generosity of the Rocco and Nancy Ortenzio Foundation and Select Medical, the Ortenzio Center's unique capabilities enable us to correlate cognitive and motor function with activity in the brain and spinal cord. How the spinal cord recovers after injury, and the mechanisms that underlie fatigue, are just two areas where we are making important discoveries. **By combining state-of-the-art technology with neuroimaging, we are adding a new dimension to our research and broadening its impact on the lives of people with disabilities. This is only possible with your support.**



YOUR SUPPORT CREATES EMPLOYMENT OPPORTUNITIES

10,000 number of individuals with disabilities connected to competitive employment since 2005.

The majority of Americans with disabilities are striving to work, according to the Kessler Foundation National Employment and Disability Survey. The Foundation's grant making encourages creative solutions to help people with disabilities overcome obstacles to success in the workplace.

Since 2005, the Foundation's targeted grant making has connected more than 10,000 individuals with disabilities to competitive employment. **Initiatives across the U.S. are transitioning an increasing number of people to the workplace.**

Transitioning Youth from School to the Workplace

Many employment and vocational programs for youth with disabilities focus on job readiness and skills training, with lesser emphasis on achieving transition from school to the workplace. 40 percent of students with disabilities leave high school without employment or post-secondary education or training. To address this need, Kessler Foundation supported 21 and Able, an initiative to effectively connect employers to students with disabilities. The result: 161 young people have been placed in jobs that pay an average of \$25 an hour. Even more impressive: Preliminary data indicate that the estimated economic impact in 2016 was \$1.1 million in salaries and benefits. Recently, two more employers have partnered with 21 and Able, showing this model can be replicated and scaled.

161 number of young people that have been placed in jobs that pay an average of \$25 / hr.

estimated economic impact in 2016: **\$1.1 million** in salaries and benefits.

KESSLER SOCIETY

Giving that Changes Lives

Leadership gifts from Kessler Society members provide Kessler Foundation scientists and grant makers with critical resources. Kessler Society members advance research discoveries and innovative employment initiatives that help people with disabilities re-imagine what's possible and realize the extraordinary. Year after year, these generous friends demonstrate a belief in our mission and a commitment to solidifying our role as a global leader in rehabilitation research and disability employment.

Membership in the Kessler Society is extended to friends who make annual gifts to Kessler Foundation totaling \$500 or more. Members change the lives of people with disabilities—helping them take their first steps, improve their memory, communicate, and overcome obstacles to employment.

Kessler Society members honor Henry H. Kessler, MD, who founded Kessler Institute for Rehabilitation after serving in World War II. His vision was

"...to treat the whole individual ...to help him or her successfully regain physical, mental, social, vocational and economic usefulness to the fullest possible degree."

Today, Dr. Kessler's vision is reflected in the institutions that bear his name—Kessler Foundation and Kessler Institute, which consistently ranks as one of the best rehabilitation hospitals in the nation. Our donors help fulfill his legacy.

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Henry H. Kessler, MD, founder of Kessler Institute for Rehabilitation

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GIVING THAT CHANGES LIVES

New Jersey Health Foundation Funds Game-changing Technology

Eye-tracking can provide much information that's useful to our researchers. Where we look and how long we look provides insight into how we are engaging in a task. Shifting our gaze can signal a yes or no response, and how our pupils react indicates whether we feel attraction or aversion.

With a gift from the New Jersey Health Foundation, directed by trustee Dean Janeway, the Rocco Ortenzio Neuroimaging Center at Kessler Foundation acquired an eye-tracking system that measures and records eye activity while participants perform cognitive tasks. This system can be used inside or outside the scanner, according to Dr. Glenn Wylie, the Center's associate director. "This system is flexible and unobtrusive, so we can easily collect eye-tracking data during our testing on participants with spatial neglect, memory deficits, emotional processing deficits, and other cognitive problems. We're also interested in integrating this capability in our studies of the underlying mechanisms of motivation and fatigue."

Foundation scientists are enthusiastic about adding a dimension to their cognitive

research. "We're beginning to see that collecting eye-tracking data can lead us in interesting and unanticipated directions," Dr. Wylie noted. "We definitely foresee the potential for new lines of investigation."



Glenn Wylie, DPhil, associate director, Rocco Ortenzio Neuroimaging Center



Eye-tracking can provide much information that's useful to our researchers.

Derfner Foundation Funds Innovative Study in Wheelchair Users

Every successful research study begins with a good idea to be cultivated. One donor chose a novel approach to jumpstarting a new avenue of research that focuses on an experimental treatment for shoulder injuries in wheelchair users with spinal cord injury.

Using a manual wheelchair stresses the upper limbs, often resulting in "wheelchair users' shoulder", a disabling complication that is difficult to treat. With a gift from the Derfner Foundation, researchers are bringing a new treatment called Lipogems to wheelchair users with spinal cord injury.

The Lipogems procedure involves extracting stem cells from the person's fat cells, then injecting them into their shoulder joint, according to study investigators Drs. Gerard Malanga and Trevor Dyson-Hudson. "It's important to look for alternative treatments," noted Dr. Dyson-Hudson, "because wheelchair users have a high risk for poor outcomes after surgery, especially if they continue to stress the joint. Also, injections of stem cells may encourage regeneration of damaged tissues in the shoulder." If Lipogems provides an alternative to surgery for wheelchair users' shoulder, this small pilot study could have a big impact on the guality of life of people with spinal cord injury, and others with shoulder injuries.



Trevor Dyson-Hudson, MD, director of Spinal Cord Injury Research

Hearst Fellowship Sparks Scientist's Career

Research fellowships help launch the careers of the next generation of rehabilitation researchers, ensuring that we continue to develop ways to improve the lives of people with disabilities. Here, we highlight our first fellowship funded by the Hearst Foundations. This two-year fellowship was awarded to Silvana Lopes Costa, PhD, a promising young scientist dedicated to finding better treatments for the cognitive effects of multiple sclerosis (MS).



Silvana Lopes Costa, PhD, inaugural Hearst Fellow

As the first Hearst Fellow, Dr. Costa has exceeded the benchmarks for disseminating her findings, and most notably, has successfully competed for major additional research funding.

The impact of this focused fellowship program is clear – this former Hearst Fellow, poised to be a leader in the field, is already contributing to the field of MS research.

Engaging the Community in our Mission

Kessler Foundation has hosted three research evenings since 2015. Donors, business and communities leaders have learned about our unique capabilities in robotics rehabilitation research, addressing obstacles to recovery after stroke, and living to the fullest with MS.



Paralyzed during a competition, Olympic ski jumper Nick Fairall demonstrates walking in a robotic exoskeleton during Kessler Foundation's 2015 research evening.

Stroll 'N Roll Reaches New Heights

In September, our 15th Annual Kessler Foundation Stroll 'N Roll attracted the largest number of people ever. More than 550 people of all ages and abilities gathered in Verona Park for this important community event, which raised more than \$135,000 to further our research and employment funding.













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