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HOW AN IPAD APP HELPS PEOPLE WITH PARKINSON'S DISEASE WALK FASTER, EXERCISE MORE, AND KEEP THEIR INDEPENDENCE
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**Faculty Honors**
Keep track of Sargent faculty achievements at www.bu.edu/sargent/news-releases.

A Source for Research News
Bookmark www.bu.edu/sargent for regular research updates. Current work includes a study on the benefits of walking for those with or at risk for osteoarthritis.

**Getting Personal**
Julie Keysor explains how her own experience with arthritis drives her work at go.bu.edu/sargent/inside-sargent.

**InsideSARGENT 2014–2015**

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About
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Dear Friends,

I am honored to provide a foreword, my first, for this issue of Inside Sargent. After nearly twenty years in academia and seven years in the federal government, most recently at the National Institutes of Health and the Department of Veterans Affairs, I’ve witnessed the evolution of health and rehabilitation from the perspectives of clinician, researcher, and academic. Now as dean, I am impressed to see these specialties come together so seamlessly at Sargent to provide a well-rounded, interdisciplinary education for our students. In particular, the College’s emphasis on technological advancement and rehabilitation science is a true testament to its commitment to academic excellence.

This issue of Inside Sargent highlights some of the ways the Sargent community is employing cutting-edge technology to make a meaningful difference in the lives of others. Faculty and students at the College’s more than 25 on-site research labs and clinical centers are studying and treating complex disorders, such as dyslexia, autism, muscular dystrophy, and Parkinson’s disease. They join our alumni in finding innovative ways to address these conditions. As you will read in the cover story, a faculty member is using an iPad app to increase exercise adherence for people with Parkinson’s. An alumnus is helping an injury-riddled NBA team reach a new performance peak. And a sophomore has leveraged her dual interests in speech and engineering to implement a new interface for people with paralysis to control their environments.

There’s no doubt that technology will continue to shape the future of our profession, but the stories in this issue highlight more than just rehabilitation science in action. As techniques and technologies change, our focus on educating the next generation of health care leaders while improving the lives of our patients and community will remain steadfast.

In my short time at Sargent, it has become clear to me what you, Dean and Professor Christopher A. Moore

With warm regards,

Christopher A. Moore
Dean and Professor

"This issue of Inside Sargent highlights some of the ways the Sargent community is employing cutting-edge technology to make a meaningful difference in the lives of others."
He instructed the children to read a series of words to themselves and press a button when two consecutive words began with the same sound. Perrachione found that children with typical reading skills showed more metabolic activity in the brain areas that are related to reading and language. They also showed more activity in areas related to hearing because they heard the words in their heads when reading silently.

In the same study, children with dyslexia activated smaller areas of their brains. “When children with dyslexia are reading words and making decisions about sound, they’re bringing their language network online less than children without dyslexia,” Perrachione says. “They’re not activating the sound areas because they have difficulty connecting the phonemes to the printed words; for instance, they have more difficulty recognizing that the word phone comprises the sounds f-o-n.”

Typical readers use both methods of processing language, Perrachione says, which allows them both to recognize new words and to process familiar speech efficiently. They compare only unfamiliar speech to their catalogue of stored words. Children with dyslexia seem to compare every word to their catalogue, which requires their brains to exert more effort.

“If they don’t have the abstract phoneme representations of speech sounds to serve as an intermediary, then it’s harder to get to the word,” Perrachione says. “It’s being blocked by not having a good way to translate between print and speech.” Perrachione’s goal is to devise training strategies to help children with dyslexia perform this translation process, enabling them to read more quickly and efficiently.

—Laura Ehleib

Tyler Perrachione explains how communication works in the brain at go.bu.edu/sargent/inside-sargent.

ATHLETIC TRAINING FACULTY HONORED

In 2014, three Sargent athletic training faculty were honored for making significant contributions to the profession. Mark Laursen, a clinical associate professor of athletic training and director of BU Athletic Training Services, was named the 2014 Athletic Trainer of the Year by the Athletic Trainers’ Association of Massachusetts (ATCM). Larry Venis, an adjunct faculty member and head athletic trainer, was elected to the ATCM Hall of Fame. And Sara Brown, a clinical associate professor and director of athletic training programs, was named a 2014 Most Distinguished Athletic Trainer by the National Athletic Trainers’ Association.

SARGENT HONORS MARATHON VOLUNTEERS

When the finish line at the 2013 Boston Marathon became the front line in a bombing attack, 16 Sargent athletic training students and their faculty mentors went from volunteers to first responders in an instant. Their training kicked in as they transported victims on stretchers and in wheelchairs to first aid tents and ambulances, performed triage, and kicked in as they transported victims to hospitals.

“The event was a great learning experience for everyone involved,” says Elizabeth Gavett, a physical therapy & athletic training professor and director of athletic training services. “The students were able to utilize what they had learned in their courses and apply it in real-world situations.”

TOP AWARDS

Julie Keyser, an associate professor and director of Sargent’s Center for Enhancing Activity & Participation among Persons with Arthritis (ENACT), has been elected chair of the Physical Activity Work Group of the Osteoarthritis Action Alliance. Joan Salge Blake, a clinical associate professor of nutrition, has been named a fellow of the Academy of Nutrition and Dietetics, the world’s largest organization of food and nutrition professionals.

BU NAMED AMONG WORLD’S BEST

For the second year in a row, BU’s health and medical education programs have been named among the best worldwide in the 2013–2014 Times Higher Education World University Rankings, conducted by Thomson Reuters. The influential survey ranked BU 22nd for clinical, pre-clinical, and health programs. To compile the ratings, the Times Higher Education reviews five areas: teaching, international outlook, research, research income from industry, and citations of faculty research. BU received an overall score of 74.8 out of 100, and a score of 95.8 for the citation of research influence, which accounts for the number of times a university’s published work is cited by scholars globally.

NEW FACULTY AND A PROMOTION

Sargent welcomes three new assistant clinical professors and congratulates one faculty member on her promotion. In health sciences, Shelley Brown (SPH’07), who studies effective policy interventions and governance issues related to noncommunicable diseases, was promoted to assistant clinical professor, and Brian Dunham, a biocultural anthropologist who applies evolutionary anthropology to global public health, joined the department.

Laura Driscoll, an assistant clinical professor of physical therapy & athletic training, has been named the 2014 Athletic Trainer of the Year by the American Physical Therapy Association. Boston College’s mission to educate students of the Sargent building, exemplifies the college’s commitment to serve its community in even the most unimaginable circumstances.
SCRAMBLED SIGNALS

GOING DEEP INTO THE BRAIN TO ANALYZE THE WIRING AT THE ROOT OF AUTISM

BY ANDREW THURSTON

A handful of labs in the world can look at the brain as a whole—all the way down to molecules and synapses. We’re one of them.”
– Basilis Zikopoulos

WebExtra
Learn more about Basilis Zikopoulos’ research at go.bu.edu/sargent/inside-sargent

When you multitask, the front of your brain is performing all sorts of acrobatics. As you flit between reading this article and scanning your email, from listening to a colleague to sipping your coffee, your prefrontal cortex is controlling the many signals darting through your head—some don’t travel far; some do, following connections that stretch all the way back to your neck. Your attention glides smoothly from article to email, from colleague to cup.

This all assumes you don’t have autism. In 2010, Basilis Zikopoulos, a research assistant professor, helped lead a study that found the prefrontal cortex of adults with autism is overloaded with connections, but that relatively few axons—the formal name for the brain’s wires—stretch from it to more distant regions. People with the disorder battle an overwhelming cacophony of signals at the front of the brain and relative silence throughout the rest.

Zikopoulos points to a section of the prefrontal cortex that is particularly affected by autism. “The anterior cingulate cortex is implicated in many processes, but primarily in attention and emotions,” he says. When noise in this area becomes excessive, “it’s very difficult to direct attention. And when the long-distance connections are weak, you get poor communication between distant areas, such as the parts of the brain dealing with your senses.” The signals become scrambled, causing problems with attention and social and emotional interactions.

Having identified the distinctive connectivity of the brains of adults with autism, Zikopoulos wants to discover when—and how—the problems begin.

As part of a new National Institute of Mental Health–funded study, Zikopoulos will have access to 30 pediatric brains—15 from children who had autism, 15 from those who didn’t. He hopes to be able to build on the earlier findings to draw a time line of autism, tracing its development and progression from before birth to adulthood.

For the next five years, Zikopoulos and a team of researchers at Sargent’s Neural Systems Lab, including the lab’s director, Professor Helen Barbas, will scan just about every square micrometer of the frontal lobes from those 30 brains. Using electron microscopes that can magnify a sample up to 100,000 times, researchers will be able to scrutinize not just individual axons, but details like the insulating layer surrounding them and the mitochondria—cell energy producers—inside them.

“I can see how neurons communicate with each other. We stain for specific proteins to see whether an axon or a neuron is inhibitory or excitatory; in other words, if it’s a stop or go signal in the brain,” says Zikopoulos. “A handful of labs in the world can look at the brain as a whole—all the way down to molecules and synapses. We’re one of them.” There are many theories about what causes autism and when the disorder starts to distort the brain’s connections, but nobody knows for sure. Genes have been implicated, but are only responsible for about 10 percent of cases. It’s possible the brain might begin to misconnect very early in development—during neurogenesis, the very birth of our neurons—or perinatally when axons begin to grow.

One of the reasons for this uncertainty is that it’s difficult to study the human brain in action. Scanning techniques such as MRI are imprecise—results have been compared to a map that only shows the brain’s superhighways, not its side roads. “It’s hard to connect behavior to molecular, neurochemical, or other features of the brain,” says Zikopoulos. “I would have to observe a person’s behavior, then take the brain out and slice it.”

The other reason for so much conjecture about how the human brain functions is that there just aren’t that many donated postmortem brains out there. The 30 brains Zikopoulos will have access to, therefore, “a pretty high sample size for postmortem tissue studies,” he says. “We’ll be looking at different brain areas at different ages and stages of development.”

After five years, Zikopoulos expects to have a lot of data. Daniel Bullock, a BU professor of psychology and an expert in computational modeling, will help him visualize it. Bullock aims to build “behaviorally predictive computational models” that can simulate brain function and the impact of different developments—paths and drug interventions. Another BU psychology professor, Helen Tager-Flusberg, director of the University’s federally funded Autism Center of Excellence, will help connect the data back to the individuals’ clinical pathways and diagnoses.

Zikopoulos calls his part of the research, “figuring out the fundamentals.” He can better understand the neurochemistry and molecular features of different brain areas—as well as how they’re all connected—he can begin to pinpoint where and when the brains of people with autism veer off from the rest of the population. “If, for example, I find there is a specific protein that is different in the two populations, we might be able to design therapies, drugs, that will target that protein.”

In the 2010 study, Zikopoulos and the Sargent team concentrated on one potential target protein, growth-associated protein 43 or GAP-43. The protein, which he says is “expressed in a specific period of development,” stimulates the growth of axons in newly forming brains. In the anterior cingulate cortex of people with autism, it seemed to do too much stimulating.

“We need to figure out what makes someone more prone to autism and what environmental factors come in and make that happen,” says Zikopoulos. [1]
Sargent is taking health care high tech

BY JULIE RATTEY

A PT APP FOR PARKINSON’S
TECH CARE FOR AN NBA TEAM
A SMILE THAT CONTROLS MACHINES

PEOPLE WITH PARKINSON’S ARE WALKING FASTER, athletes are recovering more quickly from injuries, and people with spinal cord damage may soon have new ways to communicate. Sargent’s professors, researchers, alums, and students are using technology to develop innovative solutions for people with disabilities. Here are three projects that will benefit patients, health providers, and caregivers.

IT STARTED IN DENISE’S THUMB—a slight tremor when she gestured while talking. Just part of getting older, she thought. Or maybe it’s related to that shoulder problem I’m working out in rehab. Her rehabilitation therapist disagreed. “Go see your doctor,” she said.

Stephen’s handwriting tipped him off. It was getting smaller. Then there was that shaking in his left arm. His mother had experienced similar symptoms, and he knew what the doctor would say.

Denise and Stephen, both in their early 70s, are among an estimated 7 to 10 million people worldwide who have Parkinson’s, an incurable brain disorder that affects the nervous system, causing tremors, slow movement, stiffness, and impaired balance. Terry Ellis (MED’05), an assistant professor of physical therapy and athletic training and the director of Sargent’s Center for Neurorehabilitation, is working to help patients with Parkinson’s like Stephen and Denise manage their disease through exercise.

Ellis’s research has shown that exercise can help patients improve their walking ability, strength, and flexibility, and may even slow the disease’s progression. But patients with Parkinson’s aren’t often referred to a physical therapist until years after their diagnosis, when function has begun to decline, Ellis says. Finding someone well versed in the disorder is difficult, especially in more rural areas, and patients’ engagement in exercise typically declines once therapy is over. Ellis and her colleague Nancy Latham, a research assistant professor in the Health & Disability Research Institute at the School of Public Health, hope that keeping patients in touch with physical therapists through mobile health (mHealth) technology like smartphones and iPads will help.

“Especially with the explosion of aging populations, we’re going to have more and more people with these chronic diseases,” Ellis says. “So how are we going to help them maintain a high-quality life and the highest degree of function, and to be independent and age at home? I think physical therapy has a large role, but we need to think of new models of care.”

In fall 2013, with a $50,000 grant from the American Parkinson Disease Association, Ellis and Latham began recruiting for a pilot study featuring Wellpepper, application software designed to help patients stick to treatment plans. The participants, New England–area patients with Parkinson’s, are randomized into two groups: an mHealth group that uses Wellpepper on an iPad mini provided by Sargent and a control group that follows an exercise routine with the help of the traditional paper instructions and demonstrative photos.

Participants in the mHealth group access personalized exercise videos—Sargent videotapes them performing prescribed exercises when they enter the program—and submit their daily progress and levels of difficulty and pain. They can also chat virtually with a Sargent physical therapist who receives their Wellpepper data and readings from pedometers linked to the app via Bluetooth wireless technology. Ellis chose the iPad mini based on focus group feedback, but ultimately would like to see the app available on any platform of the patient’s choice.

To participate in the program, Denise and Stephen traveled on separate occasions to the Center for Neurorehabilitation to meet with Tami DeAngelis (’02), a senior physical therapist, who guided them through several exercises and gave them a pedometer and a daily walking goal. “I hope to get fitter,” says Ellis, a PT app for Parkinson’s assistant professor Terry Ellis uses mobile health technology to keep people with Parkinson’s exercising. 4 3 2 1
“Especially with the explosion of aging populations, we’re going to have more and more people with these chronic diseases. So how are we going to help them maintain a high-quality life?”—Terry Ellis

Stephen, who’s just starting out in the paper group, “and I hope it slows down the progression of the disease.” Denise, who has finished her six months in the mHealth group, says she is “willing to try anything, just so I don’t fall through the cracks.”

Patients appreciate the ongoing interaction and accountability mHealth technology offers, Ellis says. “They want the encouragement and some level of oversight—someone saying, ‘Hey, great job! Look how much you accomplished!’” The encouragement motivates Denise, who says mHealth technology offers, Ellis says. “They want the encouragement and some level of oversight—someone saying, ‘Hey, great job! Look how much you accomplished!’”

The Affordable Care Act, which includes provisions for telehealth, is giving the field a boost, says Karen Jacobs ('79), a clinical professor of occupational therapy. Sargent has already incorporated telehealth into its occupational therapy curriculum, she says, and “is well positioned to be a global leader in telehealth, is giving the field a boost, says Karen Jacobs ('79), a clinical professor of occupational therapy. Sargent has already incorporated telehealth into its occupational therapy curriculum, she says, and “is well positioned to be a global leader in telehealth” in the field. Participants in Sargent’s new Neurological Physical Therapy Residency Program, for example, are involved in observation and research for the We Nee project.

Telehealth poses challenging questions for the health care industry: How will services be reimbursed? Will current licensing policies change to facilitate care? And what are the ethical boundaries? What steps will providers take to ensure patients’ privacy and the security of their information? But Ellis says now is the time for change. “We have to be innovative in coming up with new models of care to try to reach people. I think we can have a bigger impact than people realize.”

“Last names withheld for privacy.”

Sargent is ahead of the curve in experimenting with these technologies, which are examples of telehealth, the delivery of health services through electronic communications such as email, two-way video, and smartphones. As Ellis and Latham point out, telehealth’s possibilities are expanding as technology becomes a more integral and affordable part of people’s lives, and as health care professionals seek ways to counteract higher costs of in-person care and shorter lengths of stay in hospitals or rehabilitation facilities.

The Affordable Care Act, which includes provisions for telehealth, is giving the field a boost, says Karen Jacobs ('79), a clinical professor of occupational therapy. Sargent has already incorporated telehealth into its occupational therapy curriculum, she says, and “is well positioned to be a global leader in student training and faculty research” in the field. Participants in Sargent’s new Neurological Physical Therapy Residency Program, for example, are involved in observation and research for the We Nee project.

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“Last names withheld for privacy.”
A SMILE THAT CONTROLS MACHINES

SPEECH STUDENT CAROLYN MICHENER’S RESEARCH HELPS PEOPLE USE TECHNOLOGY THROUGH FACIAL MOVEMENT

Imagine turning on the lights, adjusting the thermostat, or operating a DVD player simply by smiling. For people who are visually or verbally impaired, or who have limited motor skills, this could be a major advance in communication. Carolyn Michener (’16) is working to make it a reality.

An undergraduate in the speech, language & hearing sciences program, Michener says her lifelong stutter and interest in engineering sparked a passion to develop technology to help others communicate. Working in the STEPP Lab for Sensorimotor Rehabilitation Engineering at Sargent College, she’s collaborating on a project to help people use facial movement and sound to control human–machine interfaces—no seeing or touching required.

"This is the sound the player will try to match. Then, a second tone sounds. This is the player’s starting point, a low pitch tone sounds. This is the player’s starting point, a low pitch ...40 bits per minute (bpm). While this speed is 50 times slower than typing on a keyboard and 15 times slower than the quickest computer mouse use, Stepp says, participants using auditory feedback were able to communicate with machines as effectively as participants using visual feedback in similar studies. “We can conclude that auditory feedback is a viable way to allow people to communicate with this kind of system,” says Michener.

Michener cowrote a paper about the project with Stepp and Favrot that she presented at the Acoustical Society of America’s biannual conference in May 2014. She continues to run trials of the game, this time to find out if players with a musical background perform better than others. Stepp says the team is also embarking on collaborations with Madonna Rehabilitation Hospital in Nebraska and the Perkins School for the Blind in Massachusetts to see how people who are blind and individuals with spinal cord injuries perform in and respond to the game.

“Ultimately I would like to see this technology in a device that can be used inside a patient’s home,” says Michener. Patients trained to associate certain musical notes with particular tasks, for instance, could match those notes using their facial movements to adjust the thermostat, operate an electric bed, turn on the TV, or communicate needs to a caregiver.

Ultimately, the ability to easily interact with various machines and devices could help patients in rehabilitation and people with disabilities communicate more effectively and live more independently.
Walking is second nature to most of us. As we navigate uneven sidewalks or step from the street to the curb, our brains are using subconscious motor planning to get our bodies from here to there in one piece. Studies show that children and adults who have a high body mass index (BMI) and who are overweight or obese have a higher risk for injuries when making their way through their environment. Simone V. Gill, an assistant professor of occupational therapy and director of Sargent’s Motor Development Lab, is researching how those with a higher BMI modify the way they walk, and how their movements might be different from someone whose BMI is in the normal range. She hopes her answers will help the 18 percent of children in the United States who are classified as obese.

In the summer of 2013—shortly after obesity was recognized as a disease by the American Medical Association—Gill conducted a study to find out whether BMI influences the motor planning and motor skills of children as they cross obstacles. The study involved 9 girls and 13 boys, ranging in age from 4 to 13; 12 were overweight or obese. Gill asked them to walk over three obstacles of different heights five times each—one was low, the height of a door threshold; one was medium, the height of a sidewalk curb; and the third was tall, the height of a step.

The children began and ended each series with a walk on flat ground, enabling Gill to compare how they moved when they were not faced with an impediment. She quantified the results using 3-D motion analysis, the same technology used in films to make animated characters appear lifelike, she says. “We put markers all over a person’s body, and there are special cameras that track the markers and tell the computer in 3-D space how your body is moving.”

While there was no pronounced difference in the way they navigated the medium obstacle, the children who were overweight and obese moved differently over the high obstacle than children with typical BMI. “Instead of lifting their foot high, they hiked it out to the side and slung it over,” Gill says. She was surprised that the children who were overweight and obese also moved differently over the low obstacle, which she had thought would be an easier task. “They raised their foot and toes higher, in the same way the kids with typical BMI raised their foot and toes over the high obstacle,” Gill says. “They seemed to know they were supposed to alter their movements, but they didn’t know how. They also tended to lean forward more. These factors suggest they have difficulty with motor planning, which affects their motor skills and increases their fall risk.”

One of Gill’s long-term goals is to determine whether the obstacle-crossing task could be used not only as a diagnostic tool to identify children who are at risk for falls, but also as an intervention to help minimize the risks. “More work needs to be done to figure out how best to help them, because this is a relatively unexplored area,” she says. She is conducting a similar study on overweight and obese adults, which indicates that having them repeat a task might effect change. That repetition, Gill adds, could also help obese children.

“I think practice matters,” she says. “I watch football and basketball players do drills that make them faster and better able to leap over people on the field. And that’s what we’re talking about: being able to adapt your movements to what’s happening in your environment. If you have a typical BMI, you don’t have to practice stepping over things; you already know how. But if it’s hard for you, then practicing actually makes you more aware of your body and less susceptible to injury.”

Practice could lead to other benefits. “We know there’s a decrease in physical activity in these kids, but we don’t know a whole lot about the differences in how they move and how that might influence the fact that they’re not moving as much,” Gill says. “An intervention that could help them with their motor skills and motor planning might enable them to go out and play more.” The ultimate payoff? An increase in physical activity, in turn, could help them maintain a healthy weight.

Simone Gill hopes her study will help overweight and obese children with their motor skills, enabling them to play more and ultimately maintain a healthy weight.
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6 MILLION
PEOPLE WITH ARTHRITIS CANNOT WALK ¼ MILE

SARGENT IS HELPING THEM TAKE THE FIRST STEPS TOWARD A MORE ACTIVE LIFE

BY LARA EHRLICH

The 52.5 million people in the United States with arthritis experience pain, stiffness, and inflammation that often keep them from performing everyday tasks. Inactivity only exacerbates their symptoms. While people with arthritis may find some relief with medicine or surgery, such treatments don’t necessarily help them change their routines to attain more fulfilling lives, says Julie Keysor, director of Sargent’s Center for Enhancing Activity & Participation among Persons with Arthritis (ENACT).

“We need a paradigm shift,” says Keysor. “It’s absolutely important to look at the pain and the medications,” but it is equally important to “make sure we’re meeting the needs of the patients in their broader daily activities.” ENACT is at the forefront of this shift, conducting two studies that focus on change their routines to attain more fulfilling lives.

At her first session Judy was faced with a flight of stairs. Kelly Pesanelli, a senior physical therapist at Sargent’s Ryan Center for Sports Medicine & Rehabilitation, said, “Let’s take one at a time, make sure your mechanics are okay, and then see if you can make it up six stairs.” She helped Judy position her legs correctly to minimize strain on her knees, and then Judy climbed six stairs pain free. She began to cry. “My first reaction was, oh my gosh, she’s in pain,” Pesanelli recalls. “But they were tears of joy.”

Like many people with arthritis, Judy had modified or avoided climbing stairs and other tasks in part because she had never received guidance on how to live with the disease. Primary care physicians don’t have time to teach patients how to adjust their movements, and referring patients to physical therapy can be “a hit-or-miss proposition,” says David Polson, director of BU’s Clinical Epidemiology Research & Training Unit. “Physical therapy prescriptions are short term, and the exercise requirement is a long-term need.” Without ongoing, individualized support, people with arthritis find maintaining a regular exercise regimen to be difficult; less than 15 percent of individuals over the age of 65 are active in the lives of the participants. “A lot of people come to know that I’ve had a professional person tell me that what I’m doing is working, that I’m not doing too much, or that I should do it—and that’s where a little TLC comes in. Participants say, ‘Yes, I did what I said I was going to do.’” Pesanelli is already finding that BOOST makes a difference in the lives of the participants. “A lot of people come

While people with arthritis may find some relief with medicine or surgery, “we need a paradigm shift,” to help patients change their routines to attain more fulfilling lives, says Julie Keysor (left), director of ENACT.

#1 52.5 MILLION ADULTS IN THE US HAVE ARTHRITIS

ARTHRITIS IS THE MOST COMMON CAUSE OF DISABILITY IN THE US

35% ARE OBSE

42% ARE LIMITED IN THEIR ACTIVITIES

8 MILLION HAVE TROUBLE STANDING

8,300,000 ARE LIMITED AT WORK

44% REPORT NO PHYSICAL ACTIVITY

2/3 WALK FEWER THAN 90 MINUTES PER WEEK

25 PERCENT OF ADULTS IN THE US WILL HAVE ARTHRITIS BY 2030

8 MILLION HAVE DIFFICULTY KNEELING

6 MILLION CANNOT WALK A QUARTER MILE

5 MILLION HAVE TROUBLE CLIMBING STAIRS

3 MILLION HAVE DIFFICULTY SITTING

*Statistics based on the average annual arthritis prevalence in the US population age 18 years or older, via the Centers for Disease Control and Prevention.
in and say, ‘I can walk my dog now. I can get off and on the T now. I can carry my laundry basket up the stairs,’” she says. “They are seeing functional improvements in their day-to-day lives, and it’s those milestones that get them to say, ‘Now I get why you told me I have to exercise.’”

“WORK IT” TO WORK LONGER
Your knees stiffen in traffic, your back aches at your desk, your fingers throb on the keyboard. People are often diagnosed with arthritis mid-career—and the disease causes disabling symptoms. More than 5 percent of adults in the United States report that arthritis limits their ability to work—and yet there is no system in place to help them retain their jobs. The pain often forces them to stop working within 10 years of being diagnosed with the disease.

ENACT’s Work It study, which began in 2010, is investigating whether early intervention can help people with arthritis keep their jobs. In the five-year study, participants meet with physical and occupational therapists for a structured, 90-minute interview at their place of employment or near their home to review the challenges they are experiencing at work. “To my knowledge, this is the first time we’re looking at having physical therapists and occupational therapists deliver this sort of intervention for people through their community,” says Keysor.

The interview includes a health evaluation and an overview of the work environment, including whether “there are issues with being able to get the support they need from coworkers or their boss,” says Linda Della-Porta, an interventionist for the study and an occupational therapist at Beth Israel Deaconess Medical Center, who often collaborates with ENACT. Therapists, like Della-Porta, explore issues like how people get to work, where they park, how far they walk, and how long they stand.

The therapist works with the participant to pinpoint goals to increase their workplace wellness and overall health. These may include making adjustments to workstations ergonomics, shifting hours to avoid a heavy commute, and working from home one day a week to lessen travel time. The intervention does not end there. Three weeks after the initial meeting, the therapist calls the participant to check in on their progress. “It’s a different way of doing therapy,” Della-Porta says. “I see this as part of a new model of telehealth.”

Della-Porta recalls one participant in a high-powered practice who needed to ask her boss to change her workload so she didn’t tire as easily. “She did a great job carrying out the intervention,” Della-Porta says. “It felt like I was really more of her guide, and she came up with some great changes that made a difference for her. Work It is very empowering for participants because therapists are not just telling them what to do. It’s getting away from that paradigm where people want somebody else to fix them. Instead, we are working together, which gives the power more to the person to make changes in their life in order to be healthier, work with less pain, and stay employed.”

A physical therapy student helps BU custodians prevent shoulder injuries

A field hockey player, Julie Collins (DPT ‘12, ’14) knows how debilitating repetitive stress injuries can be—she’s seen plenty of student-athletes with knee, wrist, and back pain. But it was her friendship with a locker room custodian named Mary that sparked her interest in preventing such injuries. “As a physical therapy student, I loved analyzing people’s movements,” Collins says. “The more I saw Mary working in our building, the more I was breaking down her movements and trying to think of better working positions for her. I became interested in the idea of giving people suggestions about how to use their bodies properly to decrease the risk for injury.”

In 2013, as part of the practice requirement for her doctor of physical therapy (DPT) degree, Collins joined Kelly Pesanelli, a senior physical therapist and lecturer in the department of health sciences, and Lee Mariniko, a clinical assistant professor and physical therapist, at the Ryan Center for Sports Medicine & Rehabilitation. Together, they developed an intervention program for BU Facilities Management & Planning: While back and knee problems are prevalent among BU custodians, their most common injuries are to the shoulder. Between 2002 and 2009, approximately 14 percent of custodial workers’ shoulder injuries were caused by repetitive motion and overuse, and these injuries alone cost the University more than $560,000 a year. “A lot of our workers were being injured doing overhead work,” says Pesanelli. “They would reach up as high as they possibly could, and just from doing that for years and years, eventually they would reach up and feel excruciating shoulder pain.”

As part of the intervention program, Collins shadowed the custodians, including Jessica, who cleaned Rich Hall’s 34 bathroom every day. “Even after cleaning just one bathroom, she would shrug her shoulders to try and lessen them up,” Collins says. By assessing Jessica and her colleagues at work and videotaping their movements for further study, Collins found that many of their injuries could be prevented through small changes, such as inverting in step stools and mops with extended handles. She also encouraged the custodians to place their buckets on desks to minimize crouching, and bend their knees instead of their backs when lifting objects from the ground.

At the end of the spring semester, Collins gave 45-minute ergonomics presentations during each custodial shift. She incorporated the videotapes into her talks to show the custodians how their work practices were straining their shoulder muscles and tendons, and explained the changes they could make to prevent pain. “I’m not trying to teach them how to do their job,” Collins says. “I’m teaching them small things they can do to make their job pain free.”

The results were striking. Since 2010, costs for shoulder injuries among BU custodians dropped by 80 percent to approximately $25,500, and, as of 2014, custodians no longer report shoulder injuries caused by repetitive motion and overuse. Collins presented the results of her program at the 2014 Combined Sections Meeting of the American Physical Therapy Association in Las Vegas, and Mariniko notes, “It’s really impressive that a student in the DPT program was able to contribute to a large institutional change.”

While Collins is pleased that the intervention has achieved such far-reaching influence, she is most grateful for its impact on BU’s custodians. “We care about them,” she says. “It’s not just about saving money, it’s about preventing injuries, and I met almost every custodian while giving these presentations,” and when she later ran into them on campus, they exclaimed, “Don’t worry, I’m cleaning right.”

“I’m using what you taught me!”

*Last names withheld for privacy

A physical therapy student helps BU custodians prevent shoulder injuries

BY RACHEL JOHNSON

CLOSING THE GAP

Despite the strides made as a result of the BOOST and Work It studies, there is still work to be done. “The research is absolutely important, but it is also crucial to train people and make sure that we get the information to the consumers,” Keysor says. This mission is central to the grant supporting the two studies, as well as a third ENACT study focused on the outcomes of total knee replacement. The Rehabilitation Research and Training Center (RRTC) grant from the National Institute on Disability and Rehabilitation Research (NIDRR) supports ENACT in training the next generation of clinical researchers and provides assistance with disseminating the results of the studies. “NIDRR wants really good, rigorous, high-quality research, but they also want to get the information to people to make a difference in their lives,” Keysor says.

The issue of closing the gap between knowledge and practice was central to the NIDRR-funded State of the Science Meeting that Sargent hosted on April 7, 2014, in Washington D.C. The 75 participants—leaders in the fields of rheumatology and rehabilitation science—discussed promoting activity and participation in the settings of community, rehabilitation, and employment, and how the results of clinical research can be translated into practice in the health care system. “We need to think of new models for care, which may be more public health-oriented or may mean merging rehab and public health,” Keysor says. “And we need to think of ways beyond the health care system to deliver them.”

BOOST and Work It could be integrated into the health care system in various ways beyond the health care system to deliver them.”

- Last names withheld for privacy

WEB EXTRA

Julie Keysor explains how her personal experience with arthritis drives her work at go.bu.edu/sargent/inside-sargent

www.bu.edu/sargent | 2014–2015 | Inside SARGENT

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BU CUSTODIANS WIN PRIZES FOR INJURY PREVENTION

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The symptoms of this fatal illness begin at birth. Parents notice muscle weakness and tightness in their child’s hips, knees, and elbows. As the illness progresses, the child suffers from poor muscle tone, limited mobility, inflammation, and fibrosis, which further reduce mobility. In the most severe cases, children require assistance for every movement, from eating to sitting upright. While many children succumb to the illness before the age of 10, medical advances like feeding tubes have allowed others to live into their 20s and 30s, albeit with constant care.

To date, there is no effective intervention for merosin-deficient congenital muscular dystrophy type IA, or MDC1A—but Assistant Professor of Health Sciences Mahasweta Girgenrath’s work has provided evidence for a combination treatment that could improve the quality of life for children with the disease, and possibly extend their lives.

Girgenrath had been using mouse models to elucidate the mechanisms of MDC1A for more than a decade when she attended a scientific meeting that changed the trajectory of her research. Organized by the new parent-led advocacy group Cure CMD, the 2009 conference brought together clinicians, scientists, and pharmaceutical-industry representatives to share research about treating congenital muscular dystrophies. For Girgenrath, it was neither the scientists nor the physicians whose counsel was most influential.

“What was huge for my research direction was meeting parents of children with muscular dystrophy,” Girgenrath says. She recalls one mother of a 16-month-old who was desperate for an intervention to slow the progression of the disease. While agonizing, the mother’s story was not unique; after hearing similar stories from countless parents, Girgenrath “recognized that these children need more immediate treatment. It helped me to prioritize what needed to happen first.” She began looking for ways to use her preclinical research to help patients now, turning to drugs already on pharmacy shelves.

Girgenrath had been identifying two major pathways that cause the symptoms of MDC1A: a dearth of healthy muscle cells and an inability to regenerate muscle. In her lab, she had successfully tested treatments to address these pathways in a MDC1A mouse model. When this mouse was genetically engineered to overexpress the protein insulin-like growth factor 1 (IGF-1), it led to improved muscle regeneration. Another study, which inactivated a mouse gene that promotes apoptosis—the normal developmental process of programmed cell death—showed even more robust results. But in both of these single mode therapies, the problems of inflammation and fibrosis remained.

Girgenrath believed that she would have even more success from two treatments that, given together, simultaneously blocked apoptosis and boosted cellular regeneration. Combination approaches are common in treating such conditions as HIV and many cancers, but relatively untested in muscular dystrophy. “It seemed clear to me very early that this disease has so many components and so many disease drivers, if you target just one component, you only get so much benefit,” she says.

When Girgenrath combined the treatments in mice—blocking apoptosis and stimulating growth—the results exceeded her expectations. Not only did the approach provide more powerful relief of symptoms than the individual treatments, it also reduced the muscle fibrosis and inflammation that are debilitating hallmarks of the disease. “There was a measurable improvement in growth and muscle mass, and in fact the interventions seemed almost synergistic,” Girgenrath says. “Patients with this disease, like these mice, don’t grow very well and have significant inflammation and ongoing fibrosis. If we can improve these children’s overall growth, it will give them not only an improved quality of life but likely an advantage to their overall longevity.”

Even as her hypotheses were being confirmed in the laboratory, Girgenrath was thinking about how her research findings might be brought to patients in the near future. She began to consider the therapeutic potential of the off-label use of drugs whose safety had already been assessed. The antihypertensive drug losartan has been shown to reduce fibrosis and inflammation in animal models. “Losartan also works on some pathways that may lead to programmed cell death,” Girgenrath says. “We now have preclinical data that show if we give losartan to the sick mice that overexpress IGF-1, they get bigger and show no fibrosis at all. We are looking at whether losartan can be combined with a growth-promoting factor like IGF-1 or growth hormone, both approved for use in children. This therapeutic combination would have tremendous translational potential.”

Girgenrath is working with physicians at the Mayo Clinic and National Institutes of Health to lay the groundwork for future clinical trials to test the use of losartan in children. In time, she hopes it will be possible to bring the combination approach to patients as well, through the dual treatment of losartan and growth hormone. Immediate treatment is a priority.

“What was huge for my research direction was meeting parents of children with muscular dystrophy. I recognized that these children need more immediate treatment.”

—Mahasweta Girgenrath
When nutrition undergraduates
Erin Reese (‘13, SP’15) and Danny Neilson (‘15) asked the Boston teenagers in their first community-cooking class whether they had prepared a meal before, they were met with silence.

“The only kid who eventually said yes, said he knew how to cook cereal,” says Gina Petracca (‘16), a nutrition graduate student.

Reese, Neilson, and Petracca helped develop the class for the Boston University Fitness & Wellness Center at the Blackstone Community Center (FitWell) in Boston’s South End. A collaboration between Boston University and Boston Centers for Youth & Families (BCYF), FitWell provides residents with the skills they need to make physical activity and healthy choices an enduring part of their lifestyles.

In the weekly cooking class, supervised by Stacey Zawacki, director of the Sargent Choice Nutrition Center, the Sargent students covered topics like nutrition, healthy meal preparation, and kitchen skills, including knife safety. At the end of class, they gave the teens grocery bags with ingredients so they could duplicate the meal or experiment with new recipes on their own. The following week, the teens shared their cooking experiences.

Reese discovered that soliciting the teens’ input as the course progressed kept them invested in the lessons. “They’d come to our class after nine hours of school, so we had to think of ways to keep them engaged,” she says. They encouraged the teens to brainstorm meals for their lessons and ensured that the classes were applicable to their daily lives. “Telling them that fruits and vegetables will help them fight diabetes one day wasn’t relevant to them,” says Petracca. Instead, they showed the teens how healthy eating choices could benefit them now—making them more fit or helping them concentrate in school. “It was a great opportunity to present healthy eating in a creative way,” Neilson says.

The cooking class posed unexpected challenges. Blackstone does not have a kitchen, so Reese and Neilson had to adapt the nutrition class for teens, while Christina Brigante (‘12, ‘14) (far right) focused on physical fitness for adults over the age of 55.

The Sargent students taught exercise classes once a week for two months, continuing to exercise after class had ended for the day. Both doctor of physical therapy students, taught physical fitness to help those over the age of 55 reduce the risk of cardiovascular disease and osteoporosis. While conducting a survey in spring 2013, Brigante and LaMay discovered that older Blackstone members often avoid the gym, “where top-40 music is playing and young, strong people are exercising,” says LaMay. “Some members of the older adult population found it overwhelming.” To ease the adults into the gym and meet their exercise needs, the Sargent students launched a specialized program to “get the members acclimated to the gym and equipment, and give them exercises based on what they wanted to target.”

Supervised by Clinical Assistant Professor Jean Peteret, the students taught exercise classes once a week for two months, focusing each session on a specific part of the body. To accommodate participants with a wide range of athletic abilities, the Sargent students selected exercises “that we could regress for people who found it too difficult, or progress for higher-level participants,” says LaMay.

Sargent students were gratified that their lessons continued beyond the classes, particularly when a teenager went home and made taco salad for his family, or an older adult continued to exercise after class had ended for the day.

Sargent students were gratified that their lessons continued beyond the classes, particularly when a teenager went home and made taco salad for his family, or an older adult continued to exercise after class had ended for the day. Both courses were so popular that FitWell renewed them for 2014. “Before FitWell opened, there wasn’t much of an option for affordable physical activity in the South End community. Programs like this help improve the members’ overall quality of life,” says LaMay.

Adults at the BCYF Blackstone Community Center had a different kind of lesson. Christina Brigante (‘12, ‘14) and Elizabeth LaMay (‘12, ‘14), both doctor of physical therapy students, taught physical fitness to help those over the age of 55 reduce the risk of cardiovascular disease and osteoporosis. While conducting a survey in spring 2013, Brigante and LaMay discovered that older Blackstone members often avoid the gym, “where top-40 music is playing and young, strong people are exercising,” says LaMay. “Some members of the older adult population found it overwhelming.” To ease the adults into the gym and meet their exercise needs, the Sargent students launched a specialized program to “get the members acclimated to the gym and equipment, and give them exercises based on what they wanted to target.”

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In the World

An assessment tool for children with disabilities in Brazil

By Lara Ehrlich and Corinne Steinbrenner

A
n your child use a stove? Walk up a flight of stairs without a handrail? Ask permission to borrow a friend's toy? Children with physical or behavioral disabilities may struggle with these and other tasks—challenges that therapists must consider as they work with parents to design individualized rehabilitation programs.

The Pediatric Evaluation of Disability Inventory (PEDI), a functional assessment for children up to age seven, tests proficiency in mobility, daily activities, and social/cognitive skills to help therapists construct rehabilitation programs for children with disabilities. Developed by Wendy Coster, a professor and chair of the department of occupational therapy, and a team of colleagues, the instrument has become widely used in the United States and other countries—including Sweden, Australia, Israel, Slovenia, Hong Kong, Iceland, and Italy—since its introduction 22 years ago. Coster’s former student Marisa Mancini (’97) brought the tool to her native Brazil, where it has inspired a profound shift in the rehabilitation field.

In 1992, Coster had just launched the PEDI when Mancini arrived at Sargent College on a Brazilian government scholarship to pursue a Doctor of Science degree; Mancini translated the instrument into Portuguese as part of her doctoral work. Upon returning to Brazil, she and her husband, Sérgio Fonseca (’97), helped to build a highly ranked rehabilitation sciences program at the Universidade Federal de Minas Gerais (UFMG). Mancini, now a professor of occupational therapy and rehabilitation sciences at UFMG, introduced the PEDI in Brazil as an alternative to the tests in use at the time, which she believed did not adequately serve children with disabilities.

Prior to the PEDI, the pediatric assessment tools employed in Brazil—and internationally—focused on specific behaviors that were direct consequences of a disease or lesion, such as the presence of reflexes and the quality of muscle tone,” says Mancini. “These behaviors said absolutely nothing about the child’s strategies to meet daily challenges, which were often taken for granted, as most typically developing children learn quickly to brush their teeth, put on a shirt, comb their hair, and other daily tasks.” Children with disabilities can find many of these activities difficult, so these tests could not sufficiently measure their ability to develop everyday skills.

The PEDI was different because it assessed a child’s ability to function within his or her home environment—information therapists could use to develop rehabilitation programs to help young clients acquire the skills they need for daily life. By bringing the PEDI to Brazil, Mancini aimed to “help professionals shift their focus in clinical practice to what really matters to children and families,” she says. Several rehabilitation centers in Brazil have since adopted the PEDI as their primary assessment tool.

In 2012, Coster and her colleagues completed an updated version of the PEDI. Now a computer adaptive test (CAT), the revised instrument, called PEDI-CAT, allows users to track a client’s change in functional performance across the entire developmental period, from infancy to age 20. PEDI-CAT is quicker and more efficient than the original paper test and produces immediate results arranged in a graphic display illustrating the child’s development. These scores allow therapists to work with families to make goals based on the assessment in combination with the parent’s knowledge of their child. The PEDI-CAT fosters “the collaborative decision-making process that is considered best practice in rehabilitation,” Coster says.

During a sabbatical in fall 2013, Coster joined UFMG as a visiting professor to help Mancini translate the instrument into Portuguese. Coster is experienced at adapting assessment tools for use in other countries, and she knew the task would involve more than simply translating words. To ensure the tool was culturally appropriate for Brazilian children, the team needed to modify some components. One question, meant to assess weight-transfer skills, addressed a child’s ability to get into and out of a sport utility vehicle. Because there is no direct translation of “sport utility vehicle” in Portuguese, and “children with lower socioeconomic status don’t have access to this kind of car,” Mancini says, the translators had to choose their words carefully. Now that Mancini’s team has a Portuguese version of the PEDI-CAT, they are collecting normative data, assessing approximately 2,000 typically developing Brazilian children to determine whether the US-based computer scoring algorithm norms are appropriate for Brazilian clients.

“Different cultures have different expectations for how and when children should become independent at these tasks,” Coster says. “American parents are big on independence, but we’ve already discovered that in some countries, it’s not a big deal whether the child is doing things independently at the same early age as in the US.” For example, not all cultures have the same timetables for when children should be able to dress themselves, manipulate a knife and fork, and brush their teeth without assistance. So, “we may need to establish Brazilian norms for the PEDI-CAT,” Coster says, with the goal of having the translation ready for use by early 2015.

In the meantime, Coster says, “research with properly translated and culturally adapted instruments will inform us about how children’s culture and context influence the timing and sequence of their skill development.” Wendy Coster

“Research with properly translated and culturally adapted instruments will inform us about how children’s culture and context influence the timing and sequence of their skill development.” —Wendy Coster
**Grant Awards**


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<tr>
<th>INVESTIGATOR</th>
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<td>Sudha Arunachalam, assistant professor of speech, language &amp; hearing sciences</td>
<td>A Non-Interactive Method for Teaching Nixon and Verb Meanings to Young Children with ASD</td>
<td>Autism Speaks</td>
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<td>Children's Representations of Verbs: Effects of Delay and Sleep on Verb Meaning</td>
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<td>Telemedicine Intervention to Improve Physical Function in Persons with Parkinson Disease</td>
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<td>Kenneth G. Holt</td>
<td>Smart Exoskeleton Suite—Biomechanically Synergistic Body Support and Protection System</td>
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<td>Kenneth G. Holt</td>
<td>Biologically inspired Soft Smart Exosuit for Injury Prevention and Performance Augmentation</td>
<td>Boston College</td>
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<td>Norman Hurst, research associate professor of occupational therapy</td>
<td>The City Connects Model of Student Support: Building It &amp; Evaluation</td>
<td>Boston College</td>
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<td>Karen Jacobs, clinical assistant professor of health sciences</td>
<td>Project Career: Development of a Multidisciplinary Demonstration to Support the Transition of Students with Traumatic Brain Injury from Postsecondary Education to Employment</td>
<td>Kent State University/ED</td>
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<td>Susan Kandarian, professor of health sciences</td>
<td>The Molecular Basis of Muscle Wasting in Congenital Muscular Dystrophy Type 1A</td>
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<td>Julie J. Kayser, associate professor of physical therapy &amp; athletic training</td>
<td>INACT- Enhancing Activity &amp; Participation among Persons with Arthritis</td>
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<td>Julie J. Kayser</td>
<td>Walkability Audit: OA Action, Phase I</td>
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<td>Gerald D. Kid, professor of speech, language &amp; hearing sciences</td>
<td>Spatial Hearing, Attention, and informational Masking in Speech Identification</td>
<td>Air Force</td>
<td>$233,739</td>
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<td>Gerald D. Kid and H. Steven Calburn, professor of biomedical engineering</td>
<td>Core Center Grant—SoundField Laboratory (Core T)</td>
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<td>Swathi Kiran, professor of speech, language &amp; hearing sciences</td>
<td>Theoretically Based Treatment for Sentence Comprehension Deficits in Aphasia</td>
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<td>$178,853</td>
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<td>Swathi Kiran</td>
<td>The neurobiology of Recovery in Aphasia: Natural History and Treatment-Induced Recovery</td>
<td>Subaward—Northwestern University</td>
<td>$241,073</td>
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<td>$1,259,537</td>
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<td>Swathi Kiran and Chakwele Sambong, predoctoral student</td>
<td>Changes in Neural Pattern in Persons with Aphasia Following Theory-Based Generative Naming Treatment (NESSA)</td>
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<td>Jessica Kramer, assistant professor of occupational therapy</td>
<td>Multicenter Career Development Program for Physical and Occupational Therapy</td>
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<td>Jessica Kramer</td>
<td>Evaluation of Project TEAM (T eens Making Environmental and Activity Modification—Effects, Social Validity and Feasibility)</td>
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<td>Susan E. Langmore, clinical professor of speech, language &amp; hearing sciences</td>
<td>Non-Invasive Brain Stimulation for Swallowing Recovery After Dyphagia Stroke</td>
<td>Beth Israel Deacoxa Medical Center</td>
<td>$175,090</td>
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<td>Carol, Lewis, assistant professor of physical therapy &amp; athletic training</td>
<td>Effect of Femoroacetabular Impingement (FAI) on Hip Motion in Young Adults</td>
<td>NIH/NAMS</td>
<td>$330,880</td>
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<td>Cara. L. Lewis</td>
<td>Sex-Specific Movement Pattern Differences in Young Adults with and without Hip Pain</td>
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<td>$203,845</td>
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<td>Cara. L. Lewis</td>
<td>3BM Phase I: Complete Nonlinear Passive-Dihalol Joint</td>
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<td>Jessica Maxwell, clinical assistant professor of physical therapy &amp; athletic training</td>
<td>Limitations in Participation Following Knee Replacement</td>
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<td>$49,191</td>
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<td>Susan McGlusk, associate professor of occupational therapy and senior research scientist, BU Center for Psychiatric Rehabilitation</td>
<td>A Demanding Study of Cognitive Remediation for Supported Employment</td>
<td>NIH/NIMH</td>
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<td>Kathleen Morgan, professor of health sciences</td>
<td>Dynamics of the Vascular Smooth Muscle Cytoeskeleton</td>
<td>NIH/NIHLB</td>
<td>$987,022</td>
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<td>Kim Muser, executive director, BU Center for Psychiatric Rehabilitation and professor of occupational therapy</td>
<td>Integrating Ems Management &amp; Recovery with Assertive Community Treatment</td>
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<td>Recovery After an Initial Schizophrenia Episode (FAI2E)</td>
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<td>Kim Muser, clinical professor of speech, language &amp; hearing sciences</td>
<td>Enhancing Assertive Community Treatment with CBT and SST for Schizophrenia Episode (RAISE)</td>
<td>NIMH/NIMH</td>
<td>$432,933</td>
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<td>Effectiveness of Psychosocial Treatment for Impacts with Psychosis</td>
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<td>Development and Randomized Controlled Trial of a Mobile System for Self Management of Schizophrenia</td>
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<td>Paula A. Quatromoni, associate professor of health sciences</td>
<td>KickinKitchen.TV—An Innovative Digital Learning Interactive Educational Program on Nutrition, Cooling and Active Lifestyle to Prevent Childhood Obesity</td>
<td>USDA</td>
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<td>Zlatka Rusnina, research associate professor of occupational therapy and senior research specialist, BU Center for Psychiatric Rehabilitation</td>
<td>Advanced Research Training Program in Psychiatric Rehabilitation</td>
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<td>Zlatka Rusnina</td>
<td>Advanced Research Training Program in Employment and Vocational Rehab</td>
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<td>Elliott Lo Saltzman, associate professor of physical therapy &amp; athletic training</td>
<td>BT: Multimodal Collaborative Research Multilingual Gestural Models for Robust Language-Independent Speech Recognition</td>
<td>NSF</td>
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<td>Modeling the Behavioral Dynamics of Social Coordination and Joint Action</td>
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<td>Joshua Stefanik, research assistant professor of physical therapy &amp; athletic training</td>
<td>Effect of Massive Weight Loss on Patellofemoral Joint Structure and Pain Limiting Patellofemoral OA/Acetabular Sit &amp; Activity</td>
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<td>Cara E. Steep</td>
<td>Methodological Basis for Robust Frequency Estimation</td>
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<td>Cara E. Steep</td>
<td>Development of an Electromyographically Controlled Electrostim (ENG-EL) Voice Prosthesis</td>
<td>Griffin-Laboratories, Inc. (NIH/NIDCD)</td>
<td>$281,970</td>
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<td>Electrostim-Graphically Controlled Electrostim for Children with Hearing Loss</td>
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<td>Gloria S. Waters, professor of speech, language &amp; hearing sciences, and William Evans, predoctoral student</td>
<td>Attention and Executive Control During Local Processing in Aphasia (NSA)</td>
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<td>Daniel K. White, professor of physical therapy &amp; athletic training</td>
<td>Factors for Change in Day-to-Day Walking in Knee OA</td>
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<td>Daniel K. White</td>
<td>Prevention of Pain and Functional Limitation in Peculiar Risk of Knee OA through Physical Activity</td>
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<td>Basilis Zikopoulos, research assistant professor of health sciences</td>
<td>Organization of Electrostimulatory and Inhibitory Prefrontal Circuits in Children with Autism</td>
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**Grant Awards**

Grant Awards 2014–2015: $55,501,354

2014–2015: $28,561,354

2013–2014: $29,940,000

www.bu.edu/sargent | 2014–2015 | InsideSARGENT


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Boston University College of Health & Rehabilitation Sciences: Sargent College has been defining health care leadership for more than 130 years. As knowledge about health and rehabilitation increases and society's health care needs become more complex, BU Sargent College continuously improves its degree programs to meet the needs of future health professionals. Our learning environment fosters the values, effective communication, and clinical skills that distinguish outstanding health professionals. Our curriculum also includes an important fieldwork component, providing students in every degree program with substantive clinical experience. Clinical internships are available at more than 1,400 health care facilities across the country. The College also operates outpatient rehabilitation centers that offer a full range of services to the greater Boston community.
Get in Touch
To visit BU Sargent College or learn more about our academic programs, research, and clinical practice, please contact us:

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Mail:
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College of Health & Rehabilitation Sciences: Sargent College
635 Commonwealth Avenue
Boston, Massachusetts 02215

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