

2024-2025

InsideSargent

Boston University Sargent College of Health & Rehabilitation Sciences



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Overcoming THE Solitude

Sargent is fighting a national epidemic of loneliness with resources and classes for students who are struggling

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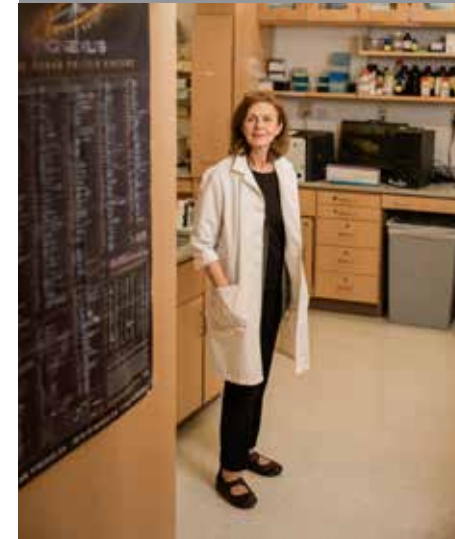
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About
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Dean's Message



Hello Everyone,

It's been an incredible first year for me as dean of Sargent College. I have had the privilege to learn so much from alumni, students, staff, and faculty. I am proud and honored to be part of Sargent College's supportive and inclusive community of learners, scholars, professionals, and practitioners—where everyone is devoted to making a difference in health and rehabilitation.

I have also had the privilege of meeting patients we treat in our on-campus clinics. I am moved by their testimonials about how working with students, staff, and faculty has helped them regain their lives. In these clinics, practice informs research, and research informs practice in real time. The results are immediate and innovative solutions, creating new treatments using state-of-the-art technology. You can see this in action in our feature story about research volunteers at the Center for Neurorehabilitation, whose transformative research was published in *Nature Medicine* (page 20).

While ChatGPT has brought artificial intelligence (AI) to the forefront of education, data science and digital health innovation have long been part of Sargent's research programs (page 16). As part of our educational mission, we convened an AI Task Force to leverage our expertise in research to best prepare students to become the workforce of the future. The task force recommended developing courses on AI in healthcare and supporting faculty's use of AI in teaching. Working with the University's leaders and University-wide AI initiatives, we will be putting these recommendations into action.

With the greatest impacts of the COVID-19 pandemic largely behind us, student mental health and well-being remains a priority in higher education. In addition to the work happening at the Center for Psychiatric Rehabilitation (page 10), the college is devoted to providing a supportive environment for all students. I am proud of the many ways our Academic Services Center and faculty advisors support this mission, as does the new lobby at 635 Commonwealth Avenue, which offers a welcoming space for frequent student gatherings, small study groups, and peer support. Come visit and take a look!

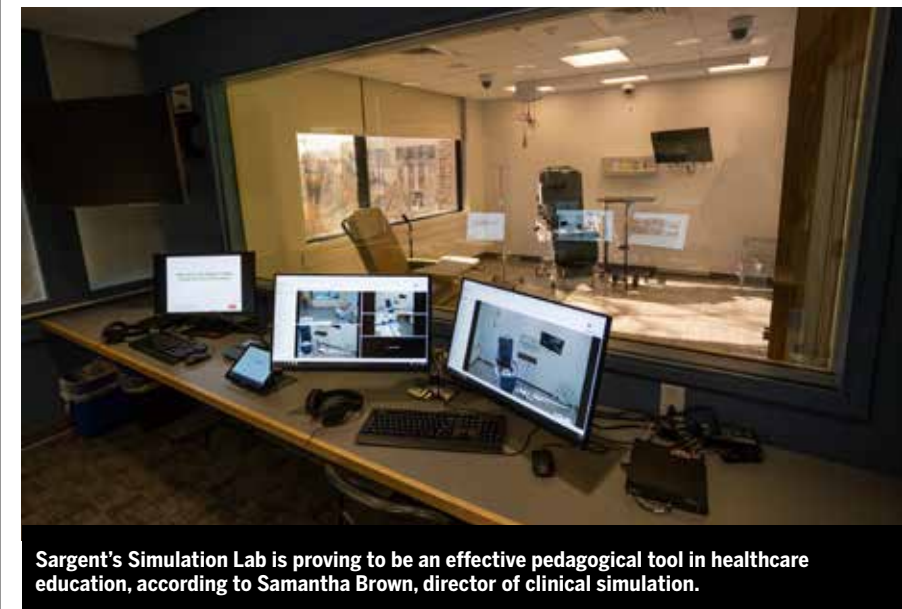
Once again, we have another ambitious year ahead of us. We have new leadership here at Boston University who know us well (page 8). We are in the middle of a strategic planning initiative, finishing a refresh of our vision, mission, and values statements, and identifying several strategic initiatives to ensure our continued leadership in health and rehabilitation sciences. I am excited by the commitment of our staff and faculty to creating a college where everyone in our community can thrive.

It is clear: Sargent College is a great place!

All the best,

Jack Dennerlein
Dean and Professor

ALEXANDRA MUNROE



Sargent's Simulation Lab is proving to be an effective pedagogical tool in healthcare education, according to Samantha Brown, director of clinical simulation.

BRIDGING THE CLASSROOM AND THE CLINIC

SAMANTHA BROWN IS SARGENT'S NEW DIRECTOR OF CLINICAL SIMULATION



SAMANTHA BROWN GOT THE IDEA for using clinical simulations with physical therapy students at a conference a decade

ago. The practice of learning in the safety of a realistic but staged environment has a long history in aviation and physician and nurse training, but this was the first she had heard about simulations used in her field. "I was hooked," she says.

Brown went on to establish Ithaca College's first simulation facility before joining Sargent in 2022 as a clinical assistant professor of physical therapy. In January 2024, Sargent appointed Brown the inaugural director of clinical simulation, a role in which she oversees the college's Center for Simulated Clinical Experience, or SIM Lab. "The SIM Lab allows students to practice their skills in a safe, non-consequential environment, make mistakes, and learn from those failures," says Sargent Dean Jack Dennerlein.

JAKE BELCHER

Brown spoke with *Inside Sargent* about the potential for simulations and creative ways that faculty and students are using the SIM Lab.

You've been involved in simulations for about a decade now. What trends have you seen in the use of clinical simulations?

When I first started to hear about simulation, it was very new in health and rehab. Now, there's more research showing that it is an effective pedagogical tool in healthcare education. So, it's expanding and becoming more widely used for physical therapy, occupational therapy, nutrition, and speech-language pathology education.

Faculty members have used simulations in their classrooms in the past. How does the lab enhance what they can do?

Simulation is a team sport, and having the lab and an operations manager for the SIM Lab will allow support for

more simulations and more education around standards of best practice for simulation in healthcare education. I see my role as assisting faculty and staff in developing their simulation expertise, following standards of best practice, providing or guiding the resources that we have available, and just making it easier and more attractive for faculty to use the lab.

What are some of the ways faculty have used the lab?

There's a lot of creativity in our faculty, which is great. Leanna Katz [a clinical assistant professor in occupational therapy] is doing training on transfers in and out of hospital beds with patients who have lines and tubes and wires. I also use the lab for similar training with PT students. [Clinical Assistant Professors] Rachel Kammer and Kelly Hansen have developed an amazing series of simulations for their speech-language pathology students for bedside swallow evaluations. We can set it up as an acute care hospital or an ICU room or as someone's home.

For students, the experience is about much more than learning a specific skill, isn't it?

Yes. Some of the big things we look at are communication, patient interaction, and professional behavior. Is the student getting the emotions of being in a hospital room? We're trying to get students ready to walk into a hospital or walk into a clinic and have an emotional connection to what's going on.

What's next?

One great thing that we're going to use the lab for is interprofessional education, where students from different health professions learn about, from, and with each other. And one of the goals I have is to connect with other partners on campus and to hospitals and clinics in the area. How can we work together, and how can they support our students in this new way of learning?

—Marc Chalufour

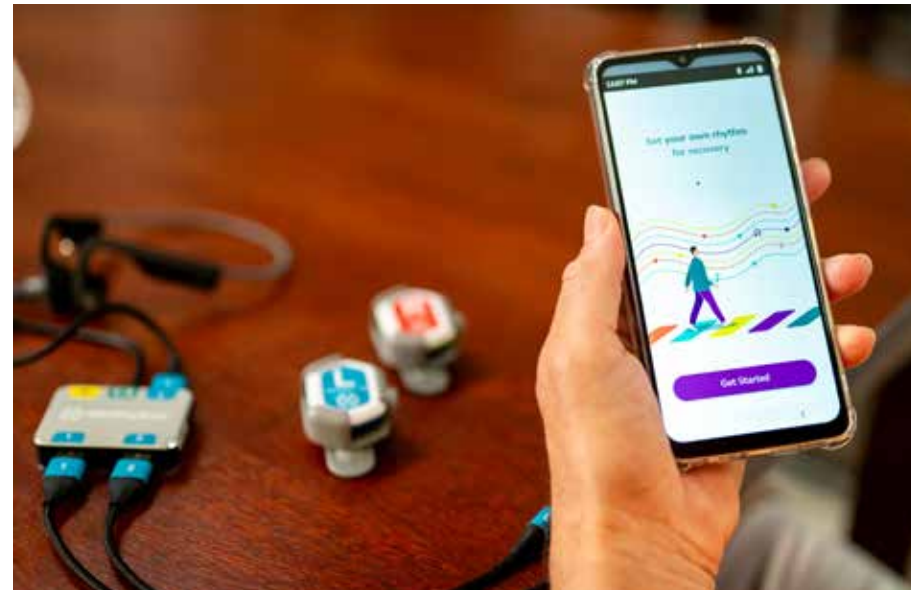
OUT OF THE LAB, INTO THE CLINIC

LOU AWAD'S RHYTHM THERAPY IS FDA APPROVED AND HELPING STROKE SURVIVORS

A DIGITAL THERAPY THAT uses rhythm and music to help people relearn how to walk after a neurological diagnosis is commercially available by prescription after being cleared by the US Food and Drug Administration (FDA) in 2023.

With the InTandem system, patients can choose a song from Universal Musical Group's giant catalog and practice walking following a stroke or Parkinson's diagnosis—which can affect gait patterns. InTandem's algorithm selects a tempo based on the patient's gait pattern and adjusts that tempo based on how well a patient keeps pace. This is good news for the nearly 800,000 Americans who have a stroke each year, many of whom experience difficulty walking afterward. The research, development, and clinical trials for InTandem were led by Sargent's Neuromotor Recovery Lab, in collaboration with clinics across the country. Lab director Lou Awad, an associate professor of physical therapy, is encouraged by the results he's seeing and the speed with which InTandem has reached the market—less than 10 years.

"A large part of this success has been an academic-industry partnership that combines a shared mission with the unique talents and skills of each group," says Awad, a clinical and scientific advisor for MedRhythms, the Portland, Maine-based company that created InTandem. A 2023 clinical trial, whose results were published in the journal *Neuro-rehabilitation and Neural Repair*, showed that even a single gait training session with an InTandem research prototype helped stroke survivors with a chronic walking impairment walk about 20 percent more symmetrically and 40 percent more efficiently. "These are major changes that are rare to see after



Using popular songs preset to specific tempos based on the user's gait pattern, InTandem is helping stroke survivors with movement difficulties relearn how to walk.

multiweek gait training programs, let alone a single gait training session, which was very encouraging," Awad says.

Then, in early 2024, Awad's team published in *Nature Communications* the findings of a multisite, randomized controlled trial that evaluated the effects of the InTandem system relative to a treatment-matched active control

"A large part of this success has been an academic-industry partnership that combines a shared mission with the unique talents and skills of each group."

—Lou Awad

group. The study, which enrolled more than 80 stroke survivors, evaluated efficacy and safety, Awad says. Some clinicians have expressed worry about an increased risk of patients falling as they walk faster, he says, but the 2024 trial revealed fewer falls among

patients using InTandem than those in the control group. "This important finding is likely because the InTandem intervention considers a patient's walking quality while it works to increase walking speed," Awad adds.

In July 2023, InTandem was listed as a Class II medical device with the FDA, clearing the way for MedRhythms to officially launch the technology as a prescription-only product on October 16, 2023. Awad says he and his colleagues continue to study InTandem, evaluating treatment duration, the reasons why some patients respond more than others, and the long-term effects on health and quality of life.

But for now, he's thrilled to see InTandem leave the research lab and help many of its users. He says doctors are writing prescriptions and insurance companies are covering InTandem.

"Insurance coverage usually takes a very long time; that insurance companies are paying for InTandem is a testament to the product and the clinical evidence available to support it," Awad says. "And the unique collaboration between the Neuromotor Recovery Lab and MedRhythms is a big reason for that."—Steve Holt

PARTNERSHIP TRAINS UNDERGRADS TO IMPROVE PATIENT MOBILITY AT BMC

WHEN PATIENTS ARE ADMITTED into an acute care setting, they tend to spend most of their time lying in a hospital bed. Days or weeks of inactivity can lead to muscle atrophy, weakened bones, and more serious complications such as blood clots and pneumonia. Research shows that getting patients up and moving early in their hospital stay can significantly reduce recovery times and healthcare costs. Unfortunately, few hospitals have the capacity to provide that level of personalized attention.

"Physical therapists come in once a day. But if a patient is a fall risk, they can't get up and walk around on their own," says Kelly Pesanelli, a senior lecturer of health science. "That's where our mobility interns come into play."

Last year, Pesanelli and Shelley Brown, program director and a clinical associate professor of health science, worked with Jenn Keenan, assistant dean of clinical education administration & community partnerships, and Karen Mattie, senior director of clinical operations at Boston Medical Center (BMC), to spearhead an innovative pilot that brought 13 health science and human physiology undergraduates to the hospital as mobility interns. Trained in Sargent's Simulation Lab—which mimics a real clinical setting, with hospital beds, IV poles, and oxygen canisters (page 3)—and at BMC, interns learned how to safely mobilize patients who were recovering from illness or surgery.

During the pilot, which ran from January through April 2023, Sargent interns completed 3,363 patient encounters, successfully mobilizing patients 1,506 times. In fact, 89 percent of patients met or exceeded their daily mobility goal and more patients were discharged to their homes instead of

post-acute facilities during the program. "Our students got hands-on experience in a level-one trauma center and acute care hospital," Pesanelli says. "It's a perfect example of how we prepare students for the future by taking them out of the classroom and letting them apply what they've learned in the workplace."

Queenie Qiu was a human physiology major assigned to the medical-surgical floor. "Right after surgery, patients can be in a lot of pain, and they either have

"Our gift as interns is that we had the time to connect with patients and listen to their stories while helping them along in their healing process."

—Queenie Qiu (CGS'21, Sargent'23)

difficulty or don't want to move," says Qiu (CGS'21, Sargent'23). She recalls working with a patient in his 70s who was

reluctant to get out of bed. As they got to know each other, the patient shared that he had once been an athlete and a fitness enthusiast, but that he had lost motivation after his wife's death.

Qiu tapped into the patient's competitive spirit and encouraged him in his mobility goal of standing for one minute. With Qiu by his side, the patient ended up standing for five minutes. "I was so glad to be his cheerleader for that moment in his journey," she says. "Our gift as interns is that we had the time to connect with patients and listen to their stories while helping them along in their healing process."

Now a medical assistant in the Pain Management Center at Brigham and Women's Hospital, Qiu says the experience changed the way she sees patient care. "Before, I was very much like, this is science. You figure out what's wrong and prescribe medication," she says. "Now, I believe it's just as much about the patient's mindset and a holistic approach to patient-centered care that really makes an impact."—Ting Yu



Internship program co-leads Shelley Brown (left) and Kelly Pesanelli (right) with 2023 mobility intern Maximus Leiss (CGS'21, Sargent'23;25) (center) in Sargent's Simulation Lab.

COURTESY OF INTANDEM

MICHAEL D. SPENCER

Sarah Gilbert, a dietitian specializing in sports nutrition, directs the Terrier Fueling Station.



FUELING STUDENT-ATHLETES' STRENGTH

IN ONE WEEK, the Terrier Fueling Station serves more than 500 protein-packed smoothies to hungry student-athletes. “And that’s just our most popular item,” says Sarah Gilbert, the station’s director and a dietitian specializing in sports nutrition for BU student-athletes. (Gilbert says the station also goes through, on average, 10 pounds of granola and 40 boxes full of Honey Stinger Energy Waffles, another favorite.)

The station, at BU’s Strength and Conditioning Center, was established in 2018. A collaboration between Sargent and BU Athletics, the Terrier Fueling Station offers free pre- and post-workout snacks to the more than 600 athletes who drop by a few times a week to lift weights. In 2020, it also spawned an outpost at Agganis Arena for the men’s and women’s ice hockey teams.

Pre-workout offerings include bananas, apple sauce, Goldfish crackers, pretzels, the energy waffles, fruit snacks, and allergy-friendly options like 88 Acres granola bars and gluten-free energy waffles. “It’s a lot of easily digested

carbohydrates,” says Gilbert (’18). After their practice or workout—when the body craves “carbohydrates for energy replenishment and then protein for muscle recovery and repair work,” she says—athletes can enjoy smoothies, Greek yogurt with granola, cheese sticks, chocolate or soy milk, and Clif bars.

“Our athletes have high needs and busy schedules, and if we can just put something right where they are, when they need it, it makes life a lot easier for them.”
—Sarah Gilbert

“We use [the station] as an educational centerpiece as well,” Gilbert says. “So, we have signs that talk about why we recommend these things before or after a workout.”

The station is open Monday through Friday, from 6 am to 6 pm throughout the academic year and for more limited hours during the summer. Each semester, it’s staffed by 20 to 25

students, including undergraduate and graduate practicum students from Sargent’s nutrition programs, health science and human physiology interns, and other Sargent students who volunteer their time.

“They all bring a unique perspective and have different backgrounds—not always nutrition—but all have these overlapping interests that culminate in sports performance and wellness,” says Gilbert. “Many student-athletes are Sargent students, and they will work with us and get to see both sides, which I think is really nice.”

Drew Marrochello, BU’s director of athletics, says he’s seen the station’s positive effect on the athletes. “The Terrier Fueling Station has been an essential resource,” he says. “It provides necessary nutritional products and education about healthy regimens to student-athletes so that they can optimize their performance.”

Gilbert has heard from athletes how much they appreciate the station’s convenience. “Our athletes have high needs and busy schedules,” she says, “and if we can just put something right where they are, when they need it, it makes life a lot easier for them.”—Mara Sassoon

CIARA CROCKER

PROVIDING BETTER SUPPORT TO DISABLED SURVIVORS

Note: In this article, we use identity-first language (“disabled people”), consistent with the preference of many in the disability self-advocacy community. We acknowledge that some people prefer person-first language (“person with a disability”).

AN INDIVIDUAL LIVING with a disability is four times more likely to be sexually assaulted in their lifetime than non-disabled people, according to the US Department of Justice. They’re also less likely to report it.

To equip New York State sexual violence advocates to better serve disabled people reporting an assault, six Sargent doctoral students in occupational therapy (OT) researched the issue and presented their findings to an annual meeting of the New York State Coalition Against Sexual Assault (NYSCASA) in May 2024.

Each student researched and presented on a different category of disability: intellectual disability, developmental delay, physical disability, hearing impairment, visual impairment, and serious mental illness. They defined each one, discussed its prevalence, outlined the specific considerations in supporting a survivor with a particular disability, and provided the advocates with resources for further learning.

“There’s a lot of information in general about sexual assault. But with sexual assault and disabilities, we want to help people avoid lumping anyone with a disability into one bucket,” says Gia Baldassano (’25), whose presentation focused on survivors with physical disabilities. “For example, someone who may have vision impairments might have different advocacy needs from someone who has Down syndrome.”

Anne Cunningham (’25) presented on advocacy needs of survivors with intellectual disabilities. She says she’s found that disabled people, and those

with intellectual disabilities in particular, are sometimes stereotyped as being asexual, which can make it even more difficult for them to recognize when they have experienced abuse and make it more challenging to reach out for services.

“I feel like I can’t hammer home enough the emphasis on needing comprehensive sex education that’s accessible and available to not just disabled people, but all adolescents and all people, generally,” Cunningham says.

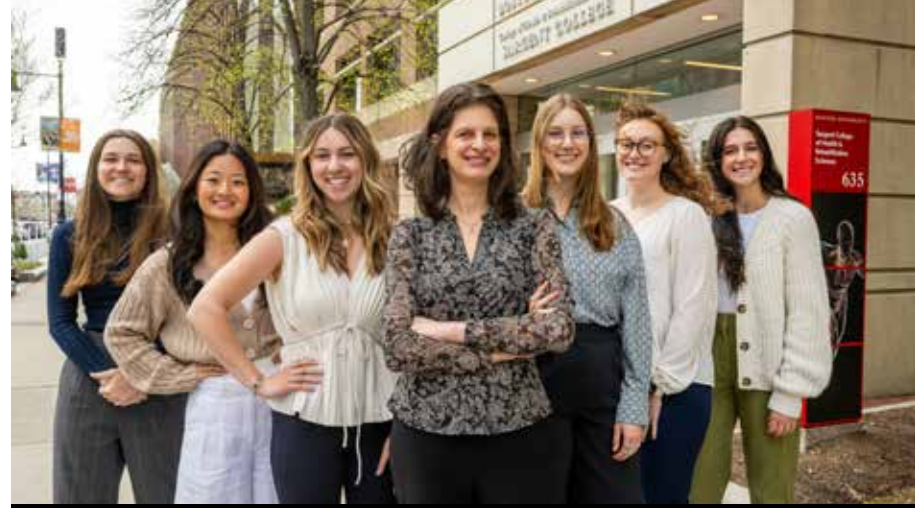
“We want to help people avoid lumping anyone with a disability into one bucket.”
—Gia Baldassano (’25)

The opportunity for Sargent doctoral students to speak in May was the result of a conversation between William Rivera, NYSCASA interim executive director, and Emily Rothman, professor and chair of occupational therapy, about one of Rothman’s research studies on counseling college sexual assault survivors who are autistic. Rivera indicated he would like to address the topic at the 2024 training for sexual assault advocates and counselors.

Rothman immediately thought of her students.

“I told Will, ‘I know a bunch of students who are pretty passionate about trying to convey information about how to help disabled people and are also passionate about sexual violence prevention. So, I see a real fit here,’” Rothman says. Within an hour of emailing 42 of the OT entry-level doctoral students asking for 6 volunteers to help with the presentation, Rothman had her group set. She says the students, who were not paid for their work, stepped up because they care deeply about helping assault survivors in the disability community. A few of the students, Rothman says, reached out to disabled individuals in order to build their sections of the presentation.

“I feel very impressed by the students and grateful to them,” Rothman says. “As a teacher, one of the things I appreciated about this opportunity is that we found a way to capitalize on the raw energy and enthusiasm that students bring to addressing real-world challenges, where we’re showing up as our best selves, as teachers, as learners, and as community members. I see them learning by leaps and bounds, because they’re learning as they’re doing. So, it’s a win-win all the way around.”—Steve Holt



Presenters included Kelly Kronemeyer (’25) (from left), Dayna Kim (’25), Karly Britt (’25), Emily Rothman, Sargent professor and chair of occupational therapy, Natalie Schmidt (’25), Anne Cunningham (’25), and Gia Baldassano (’25).

CYDNEY SCOTT

SARGENT DEAN EMERITA GLORIA WATERS NAMED BU PROVOST

GLORIA WATERS, a professor of speech, language, and hearing sciences who served as Sargent’s dean from 2005 to 2013, was appointed the University’s provost and chief academic officer on July 1, 2024. A member of Sargent’s faculty since 1997, Waters has increased the college’s focus on undergraduate education in health science and human physiology. She has served as the University’s vice president and associate provost for research since 2013, during which BU’s research expenditures grew from \$343 million to \$543 million.

As provost, Waters will work closely with faculty, staff, and students in BU’s 17 schools and colleges and the Faculty of Computing & Data Sciences. Boston University President Melissa Gilliam praised Waters’ oversight of BU’s research initiatives, adding that “as provost, Gloria will focus on creating a collaborative, nimble, and proactive provost’s office that will enhance the experience and academic excellence of our faculty and ensure a high-quality experience for all students.” —*Steve Holt*



AWARDS & HONORS

Erin Carpenter (’20, ’25) and **Michael Scimeca** (’20, ’25), PhD students, received the prestigious Ruth L. Kirschstein National Research Service Award (NRSA) Individual Predoctoral Fellowship (Parent F31) from the National Institutes of Health.

Diane Dalton, a professor of physical therapy, was recognized as an Honorary Fellow in the American Academy of Orthopaedic Manual Physical Therapy.

Dean Jack Dennerlein, also a professor of physical therapy, was inducted into the American Institute for Medical and Biological Engineering College of Fellows.

Simone Gill, an associate professor of occupational therapy, was honored with the AOTF Leadership Service Commendation.

Elizabeth Hoover (CAMED’13), a clinical professor of speech, language, and hearing sciences, received the Fellowship of the Association from the

American Speech-Language-Hearing Association (ASHA).

Karen Jacobs (’79), a clinical professor of occupational therapy, was honored with the American Occupational Therapy Foundation (AOTF) Presidents’ Commendation in Honor of Wilma L. West.

Swathi Kiran, the James and Cecilia Tse Ying Professor in Neurorehabilitation, received the Honors of the Association from ASHA.

Cara Stepp, a professor of speech, language, and hearing sciences, was inducted into the American Institute for Medical and Biological Engineering College of Fellows.

FACULTY APPOINTMENTS

Dustin Allen, clinical assistant professor, health sciences

Temor Amin-Arsala, clinical assistant professor, occupational therapy

Hayford Mawuli Avedzi, clinical assistant professor, health sciences

Sarah Barnes, lecturer, health sciences

Jennifer Bentley, clinical assistant professor, speech, language, and hearing sciences

Leanna Katz, clinical assistant professor, occupational therapy

Eileen O’Keefe, chair, health sciences

Shannon Peters, clinical assistant professor, health sciences

Margaret Salvia, clinical assistant professor, health sciences

Keith Spangler, clinical assistant professor, health sciences

FACULTY PROMOTIONS

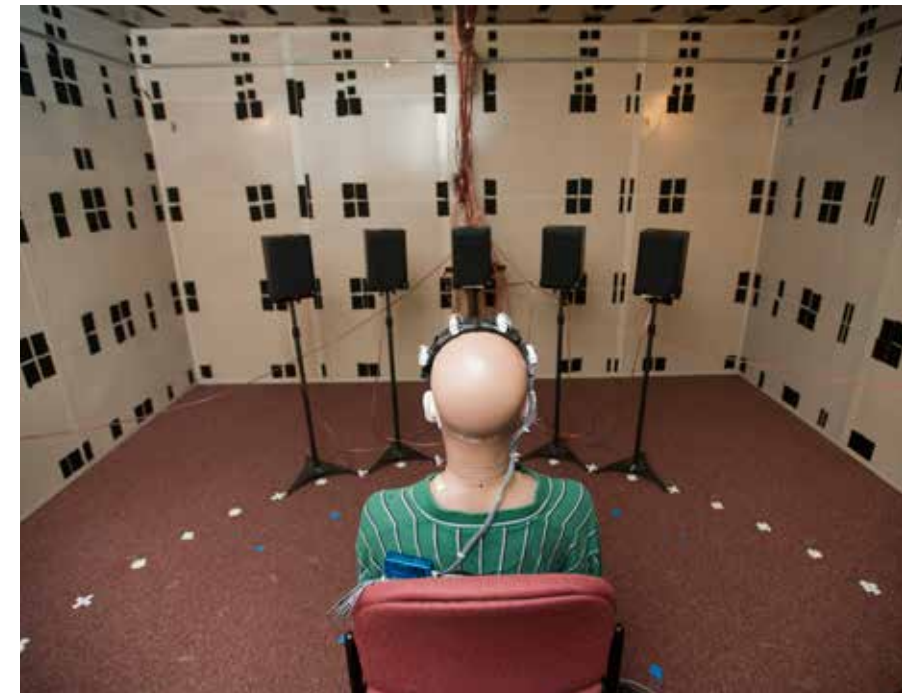
Lisa Brown, clinical associate professor, physical therapy

Shelley Brown, clinical associate professor, health sciences

Deepak Kumar, associate professor, physical therapy

Dara L’Italien, senior lecturer, physical therapy

Leanne Yinusa-Nyahkoon (CGS’98, Sargent’01, ’03, ’09), clinical associate professor, occupational therapy



Faculty at Sargent’s Hearing Research Center are studying every step in the auditory pathway, from the periphery up to the brain, says Gerald Kidd, a professor of speech, language, and hearing sciences and a faculty member in the HRC.

BU’S HEARING RESEARCH CENTER HAS A NEW HOME AT SARGENT

WHEN BIOMEDICAL ENGINEER H. Steven Colburn established BU’s Hearing Research Center in 1995, he envisioned experts from across the field of hearing science collaborating on research projects. It worked just as he had planned.

Over the years, the Hearing Research Center (HRC) has helped researchers like Gerald Kidd, a professor of speech, language, and hearing sciences and a faculty member in the HRC from its inception, to conduct cross-disciplinary projects. One of them involved developing a prototype for a visually guided hearing aid that uses an eye-tracker to help the wearer focus on a particular sound based on where they are looking, something that is particularly helpful when having a conversation in a noisy environment.

“Early on, the Hearing Research Center was kind of unique because we had an expert studying almost every step in the auditory pathway, from the periphery up to the brain,” says Kidd, who leads the HRC’s Psychoacoustics Laboratory and specializes in research on how we process sound in loud environments.

Colburn, a professor emeritus of biomedical engineering, retired in 2021, and Tyler Perrachione became the HRC’s new director. Perrachione, an associate professor of speech, language, and hearing sciences, was already well-versed in the HRC’s work. He’d been leading the Communication Neuroscience Research Laboratory and was prepared to build on Colburn’s vision.

“The HRC has a number of faculty members, and many have labs of their own,” says Perrachione, whose research focuses on how the brain decodes sound and makes linguistic meaning. “But there’s a shared thread across all of these laboratories, which is hearing and how the brain solves this puzzle of sound. The

center is an opportunity to bring people together to engender new collaborations, to bring in speakers who are of interest to lots of people, and to catalyze new ideas through interactions.”

And as of the 2023–24 academic year, the HRC has moved from the College of Engineering to Sargent College.

The move fits with students’ growing interest in hearing science, Perrachione says. “The undergraduate program in speech, language, and hearing sciences, historically, has prepared students to go to graduate school in speech pathology,” he says. “But increasingly, more and more of our undergraduates want to go to graduate school in audiology, and they want to conduct research in hearing science. Over the past five or so years, we’ve gone from having one student every other year who wanted to be an audiologist to having three or four students a year who want to be audiologists.”

“Now, we’re thinking about what the Sargent community brings to hearing that’s different from the engineering community.”

—Tyler Perrachione

Perrachione is excited by the move. “Now, we’re thinking about what the Sargent community brings to hearing that’s different from the engineering community,” he says. “We can start to investigate some of the more clinical implications of hearing and hearing rehabilitation. And how does that link with other aspects of people’s psychology, behavior, or resources? How is hearing situated in public health? How is hearing situated in psychology and cognition and the brain? I think that there will be a more health-oriented and person-oriented approach to hearing-related questions now that things are at Sargent.”—*Mara Sassoon*

JACKIE RICCIARDI

CYDNEY SCOTT

Overcoming the Solitude

AMID A NATIONAL EPIDEMIC OF LONELINESS, SARGENT'S CENTER FOR PSYCHIATRIC REHABILITATION IS WORKING TO HELP STUDENTS BUILD INTERPERSONAL SKILLS AND THRIVE IN THEIR COMMUNITIES

BY ALENE BOURANOVA



“Our primary value is personhood—that is, that everyone matters, that people who live with mental health conditions matter, and that their lives matter.”

—Dori Hutchinson

The Center for Psychiatric Rehabilitation's Paul Cherchia (from left), Dori Hutchinson, and Chelsea Cobb are committed to supporting students who feel alone.

The reports are in: young people in this country are struggling.

The United States recently dropped out of the top 20 on the world's happiest countries list, a fall driven by Americans under 30 reporting feelings of loneliness and general dissatisfaction with the world. Last year, US Surgeon General Vivek Murthy declared loneliness an epidemic, pointing to its debilitating effects. Experts say loneliness can contribute to increased risks of strokes, dementia, heart disease, and premature death.

“For a variety of reasons, young adults come to college with less developed interpersonal skills,” says Dori Hutchinson, executive director of Sargent’s Center for Psychiatric Rehabilitation (CPR). “The pandemic, the use of technology to an extreme, their highly structured childhoods—I think we see the consequences of these influences in the growing amount of cyberbullying, rising rates of debilitating anxiety and depression, and the growing number of students who express loneliness.”

Enter CPR, a mental health research, training, and clinical services center that’s dedicated to helping individuals of all ages with psychiatric disabilities. The center does not diagnose conditions, prescribe medications, or provide treatments. Rather, it offers comprehensive services and programs that give clients the abilities and support needed to succeed on whatever path they’ve chosen for themselves.

A PLACE TO GO WHEN YOU FEEL ALONE

CPR has implemented a number of programs for students at BU and beyond who live with mental health conditions or feel adrift or alone.

College Mental Health Education Programs (CMHEP), one of CPR’s core initiatives, offers a collection of services—such as classes, one-on-one counseling, and even group workouts.

The flagship offering is NITEO. Latin for “to shine” or “to thrive,” NITEO is an intensive, semester-long program for students who’ve had to take a leave of absence from any college or university for mental health or substance dependency reasons. The in-person program prepares them to resume their education through a host of resiliency- and academic skill-building activities.

One of the key components of NITEO is the Healthy Relationships curriculum.

Healthy Relationships is a set of 25 lesson plans that help students develop a sense of self and of belonging within their communities. (Healthy Relationships is also offered as a restorative justice course for respondents in Title IX cases.) Students in the group lessons understand what constitutes a healthy relationship versus one that violates cultural or legal norms, learn about giving and receiving consent, assess what they value in romantic partners and friends, and build general communication abilities.

Healthy Relationships is also part of LEAD BU, a one-credit wellness and academic skill-building course available to all

BU students. (Students can register on MyBU Student.) The semester-long course covers classroom topics like test-taking strategies and presenting projects, while the wellness portion integrates the Healthy Relationships curriculum to teach students self-care and interpersonal skills.

Healthy Relationships, piloted in the summer of 2019, grew out of an online course on relationships for autistic adults codeveloped by Emily Rothman, professor and chair of occupational therapy. The CPR’s version uses Rothman’s course as a springboard. The lessons constantly adapt in response to student feedback and staff observations. But at their core, they teach participants how to build and maintain relationships—which can combat loneliness, says Chelsea Cobb (CAMED’17), assistant director of CMHEP and one of NITEO’s facilitators.

That’s also where the curriculum’s recent tweaks come in. Part of the CMHEP’s job is to identify what issues students are struggling with and what skills they need to learn to overcome those issues. Following the COVID-19 lockdown and the feelings of loneliness it exacerbated, the CMHEP added lessons on topics such as effective interpersonal communication skills, how to develop new friendships and enhance ongoing ones, and the benefits and challenges of technology like social media and dating apps, Cobb explains.

Teaching students how to make meaningful connections is integral to the center’s broader mission, Hutchinson says.

“Our primary value is personhood—that is, that everyone matters, that people who live with mental health conditions

matter, and that their lives matter,” Hutchinson says. “My personal mission is to ensure that we can continue to conduct innovative research, training, and services that support people who come to us in flourishing.”

Flourishing, she adds, includes a sense of social connectedness. “A growing number of students indicate that they are not flourishing,” Hutchinson says. “I see our college mental health services as ways that we are contributing to combatting the loneliness epidemic that students report.”

CREATING SPACE FOR COMMUNITY

Both Hutchinson and Cobb say that one of the greatest strengths of the Healthy Relationships curriculum is that it’s adaptable to any population or situation. For example, the CPR has worked with colleges as far away as the University of St Andrew’s in Scotland and the University of Alaska to offer the curriculum to their students.

Another strength: students in the same cohort often end the course as friends.

“In class, we’re always asking the group: What would you do? How would you respond to this situation?” says CMHEP senior training associate Ali Theis (SSW’18). “It takes time to build that community, but you get to the point where students are sharing their experiences and working through things together. That takes vulnerability. That added piece of cohesion is something I’ve really loved about the curriculum and the spaces it’s created.” ■

WORDS



KIM CRESPO STUDIES HOW BEING BILINGUAL AFFECTS COGNITIVE AND LANGUAGE DEVELOPMENT

BY TING YU

Kimberly Crespo’s understanding of the world has always moved seamlessly between English and Spanish. Her Colombian mother and Puerto Rican father spoke mostly Spanish at home, and Crespo and her three siblings felt at ease alternating between languages in their racially and ethnically diverse Elizabeth, N.J., neighborhood.

“Being able to switch between two languages opens up your world,” she says. “The way that meaning and knowledge are encoded differs across languages. For example, in Spanish, you have multiple words that can index different gradients of love. To me, being bilingual provides a linguistic flexibility that’s important.”

Crespo, an assistant professor of speech, language, and hearing sciences, became interested in language development as a teenager, when her youngest brother was diagnosed with a speech delay. While her mother was working, Crespo would bring him to his speech pathology appointments at the local elementary school. “I was fascinated by this idea of him learning language through play,” she recalls.

The first member of her family to attend college, Crespo enrolled at Kean University in Union, N.J. Through a college work-study program, she found a job as an assistant in the speech pathology department and soon connected with a mentor who encouraged her interest in research. Crespo went on to earn her PhD in communication sciences and disorders from the University of Wisconsin–Madison. Since joining Sargent in 2022, Crespo has channeled her passion for dual-language representation into her research.

LANGUAGE, COGNITION, AND BILINGUALISM

As director and principal investigator of the Bilingual Learning Lab (BLL), Crespo explores how the bilingual experience influences language and cognitive development. She wants to understand how bilingual parents speak to and teach their children at home and how dual-language input shapes word-learning and semantic development (how word meanings are represented, organized, and connected). “Most language acquisition studies don’t include bilingual kids or kids with language disorders,” she says, “so, we actually don’t know how robust these theories are in other contexts and with other learners.”

It’s a problem compounded by the reality that being bilingual tends to intersect with being lower income. “We know that lower socioeconomic status is tied to poorer language outcomes,” Crespo says. “These studies ultimately inform policy and curriculum. We need to be able to generalize to multiple populations, and that includes kids who are brought up bilingually.”

At the BLL, Crespo says, the goal is to recruit more diverse populations to participate in studies, rather than focusing narrowly on one subgroup or another. “Our approach is to look at the full continuum of language ability, including kids who traditionally fall under a developmental language disorder category,” she says, “That’s just a more equitable—not to

CIARA CROCKER

APART

mention analytically robust—way of testing how language ability influences children’s learning.”

Last year, Crespo and collaborators at UW–Madison published a study that tested the effect of code-switching, or alternating between two languages, on word-learning in Spanish-English bilingual children. Bilingual parents—especially those who have children with neurodevelopmental disabilities—are routinely advised to speak to their kids in only one language. The assumption is that dual-language input hampers language acquisition.

Crespo’s study found no empirical evidence to support that practice. In fact, her findings suggest that code-switched input *does not* impede word-learning and that it may enhance vocabulary growth over time. “A crucial practical finding is that children with lower levels of language ability learn just as well from code-switched input as from single-language input,” Crespo says. “This should reassure parents, educators, and clinicians who are concerned that code-switched input may be nonoptimal for children with language difficulties.”

“Our approach is to look at the full continuum of language ability, including kids who traditionally fall under a developmental language disorder category. That’s just a more equitable—not to mention analytically robust—way of doing it.”

—Kimberly Crespo

CURRENT AND FUTURE RESEARCH

Crespo’s current research examines how bilingualism influences word-learning in late-talking toddlers. “We know that bilinguals represent meanings of words across two languages,” she says. “A child might know the word ‘ball’ in English but understand the different properties of a ball in Spanish. My question is, how do kids make connections and leverage this information that is encoded in two different languages to learn something new?”

Crespo has a hunch that when bilingual caregivers follow recommendations to limit dual-language exposure to kids with language delays, children may lose the “semantic richness” they would have received from the language they speak at home—to the detriment of their learning outcomes. Preliminary data show that “more bilingual experiences make kids better word learners,” she says. “A longer-term question is, what are the cascading effects of that? Could this help us better understand the variability in language outcomes and language abilities in kids?”

Crespo hopes her lab can lead in advancing research that prioritizes linguistic diversity. “Bilingual families and children bring valuable insights into the adaptability and plasticity of the human brain,” she says. “Embracing the experiences of dual-language learners not only enhances our understanding of language development but also fosters cultural competence and equity in speech-language services. It’s the only way we can create more inclusive and effective therapeutic models for all learners.” ■



Do Brain Injuries Affect Bilingual Individuals Differently?

Two Speech, Language, and Hearing Sciences PhD candidates—Erin Carpenter (‘20,’25) and Michael Scimeca (‘20,’25)—were awarded the prestigious Ruth L. Kirschstein National Research Service Award Individual Predoctoral Fellowship from the National Institutes of Health. The grant provides funding for a dissertation research project as well as a graduate stipend for living expenses. Both Carpenter and Scimeca work with Swathi Kiran, the James and Cecilia Tse Ying Professor in Neurorehabilitation, in BU’s Center for Brain Recovery. The center, which Kiran directs, aims to understand language processing and communication after brain injury.

Using noninvasive neuroimaging techniques, Carpenter will study neural and behavioral differences between monolingual and bilingual individuals in neurotypical and aphasic populations. “There are a lot of theories that bilingualism enhances cognitive function by training other areas of the brain,” Carpenter says. “I hope to be able to show that, in cases of dementia or stroke, bilinguals have more cognitive reserve and resilience to that damage because they rely on different neural regions for certain tasks.”

Scimeca’s research will examine how bilingual individuals with aphasia navigate reading different word or sentence structures after a brain injury. “If we can determine that certain linguistic structures make reading more challenging [for stroke victims], those might be good targets for intervention,” Scimeca says. “If we can train recognition and better comprehension of those structures, it could result in better treatment outcomes and improvement in reading recovery after a stroke.” —Ting Yu

Investigating Vascular Dementia

KATHLEEN MORGAN HAS PIONEERED RESEARCH INTO THE CONNECTION BETWEEN CARDIOVASCULAR AND BRAIN DISEASES—BUT THERE’S WORK LEFT TO DO

BY MARC CHALUFOUR

Skeletal muscles control our movements, posture, and strength. Cardiac muscles pump our hearts. Smooth muscles contract the uterus during childbirth, move nutrients through our digestive systems, and control the flow of blood in our vascular system—but they are poorly understood. “It’s wide open,” says Kathleen Morgan of the field she’s devoted her career to. “We know almost nothing about these muscles.”

Morgan, a professor of health sciences, believes that smooth muscles hold the clues needed to connect two of the world’s deadliest diseases—cardiovascular and Alzheimer’s—and to develop cures. Cardiovascular disease, including strokes and heart disease, kills more people than any other cause—nearly 18 million annually, according to the World Health Organization (WHO)—and no cure exists. Cardiovascular disease can lead to damage of the blood vessels in the brain and the loss of cognitive ability, known as vascular dementia. Cures for diseases of the brain, such as Alzheimer’s, have also proven elusive. What if, Morgan wonders, the brain damage that leads to dementia is originating in the vascular system? There’s already an established correlation: as many as 80 percent of people with Alzheimer’s also have cardiovascular disease, according to the Alzheimer’s Association.

Our hearts push blood to our brains via the aorta, the central highway of the body’s circulatory system. The aorta’s smooth muscles prevent the blood from speeding into the brain so fast that it ruptures blood vessels—which can happen suddenly, as during a stroke, or more gradually, as the aorta stiffens with age and loses its buffering power. The seemingly complex phenomenon of dementia, which includes challenges with reasoning and memory loss, could be traced back to the basic contractions of a blood vessel. “It’s a motor thing—it’s muscles contracting at the wrong time or in the wrong way,” Morgan says.

One common target of Alzheimer’s research is amyloid plaque, a protein that can build up in the brain and kill

neurons. Morgan wonders if plaque is the product of a greater problem: vascular bleeding. “When blood vessels get stiff, and you’re pounding with high blood pressure on the brain, maybe *that* is the initial cause,” she says. “That’s my hypothesis—that vascular dementia comes first.”

To explore her hypothesis, and to find ways to prevent vascular bleeding, Morgan had to learn more about the brain. She started by talking with her Sargent colleagues, including Helen Barbas, a professor of health sciences and director of the Neural Systems Lab. “She’s considered one of the most important people in the field of smooth muscle physiology,” Barbas says of Morgan. “It’s not an easy transition [to studying the brain] because you’re navigating something that’s much more complex than the muscle.”

Next, Morgan wants to learn how the different forms of the protein control contraction and relaxation in smooth muscles. A calponin-based therapy, properly targeted, could potentially control the smooth muscles in our blood vessels. But how to steer that therapy to its intended target? Morgan has been collaborating with BU’s College of Engineering on a technique to deliver drugs to hyper-specific parts of the body—such as the blood vessels around the heart—by guiding microbubbles of inert gas with an ultrasound beam. A drug coupled with an effective delivery system could have an immense impact. According to the WHO, 55 million people live with dementia today and 10 million more are diagnosed each year.

Morgan’s father was one of those people. At the time she was deciding to focus her research on smooth muscles and vascular dementia, he was dying from Alzheimer’s disease. “I watched him go from a bright man who taught me an awful lot to a guy who didn’t know who I was,” she says. “That really motivated me.”

After years of study, Morgan is confident in the progress she’s made. “I’m absolutely convinced that we can find an approach for Alzheimer’s if we can address the vascular problem,” she says. ■

**NEW
FRONTIERS**

IN

**DIGITAL
HEALTH**

**FROM APPS TO AI,
SOPHISTICATED
TOOLS ARE HELPING
SARGENT FACULTY
EXPAND RESEARCH
AND TREATMENT
OPPORTUNITIES**

BY MARC CHALUFOUR

The activities of our daily lives—walking around town, using our phones, playing video games—serve many purposes. They allow us to be productive, stay informed, and relax. Now, thanks to a wave of new digital technologies, those same activities can double as health

interventions and research opportunities that are not only more convenient but, potentially, more effective and accurate.

Leveraging digital tools to improve access and broaden Sargent’s reach isn’t new. One of the college’s marquee digital programs—the online postprofessional doctorate in occupational therapy—has been training leaders in the field for almost two decades and has alumni on six continents. And the Center for Psychiatric Rehabilitation was an early adopter of telehealth services to expand their life coaching program for college students. But recent years have brought on newfound digital innovation, catalyzed by lessons learned when teaching and research were forced online during the COVID-19 pandemic.

Karen Jacobs, a clinical professor of occupational therapy, is Sargent’s associate dean for digital learning and innovation, a position that was created in 2019. She’s a liaison with the wider BU community, including Digital Learning & Innovation, which includes the Center for Teaching & Learning and the Shipley Center, programs that support faculty looking to innovate.

She’s also an in-house resource for faculty. She helped train faculty members in remote learning technology in the early days of the pandemic. Four years later, she’s able to focus on more proactive ideas—like the use of artificial intelligence in OT interventions (see “Artificial Intelligence, Real Benefits,” on page 18).

“We have a mindset of innovation at Sargent College,” Jacobs says. “It’s exciting. I feel very grateful to be working at this period in time when things are just exploding with possibilities to be innovative.”

“Technology... will provide opportunities to supplement and extend the support that you get in one-on-one psychotherapy sessions.”

—Dan Fulford



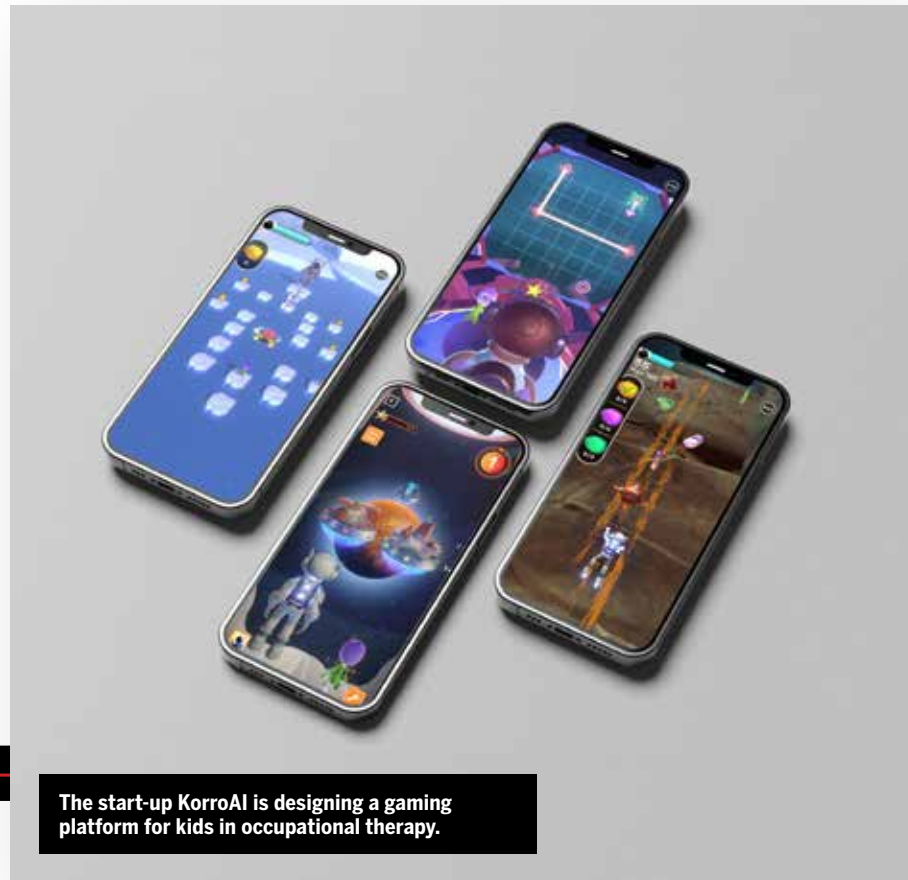
Dan Fulford



Karen Jacobs



Deepak Kumar



The start-up KorroAI is designing a gaming platform for kids in occupational therapy.

ARTIFICIAL INTELLIGENCE, REAL BENEFITS

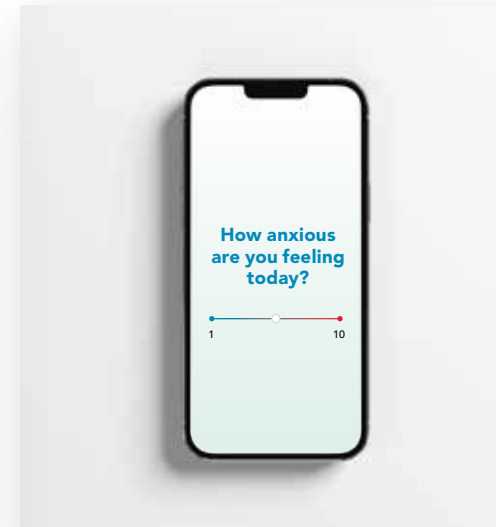
Karen Jacobs is excited about artificial intelligence. “I don’t see any limitation to the potential, quite frankly,” she says. It’s a message she delivered in an address to the OT conference in South Africa and will bring to the New York State Occupational Therapy Association as their keynote speaker in November 2024. “I want to be in on the ground level, helping companies understand what we do as occupational therapy practitioners so that we can advance the use of AI in an ethical and responsible manner,” she says.

For more than a year, Jacobs has been working with KorroAI—a start-up that is designing a gaming platform for occupational therapy practitioners to use with kids living with a wide range of diagnoses—to conduct feasibility tests for its first product. In the game, participants play an astronaut exploring new worlds and navigate challenges like climbing a virtual rock wall. The game uses computer vision, an AI-powered

technology that interprets images, to assess the skill level of the participant and adapt the game’s level of difficulty.

KorroAI represents a breakthrough on multiple fronts, Jacobs says. Occupational therapy practitioners might see a child only once a week and can struggle to motivate them to practice at home the skills they’ve learned in the clinic. The gaming experiences provide a more appealing way for kids to practice the skills they’re working on with their occupational therapy practitioners—who in turn can receive data about each child’s progress. The AI adaptations also mean a child can get more out of the experience—a child learning to write, for example, might typically practice holding a pencil whereas the gaming experience can provide different finger isolation exercises and gradually adjust the level of difficulty.

COURTESY OF KORROAI



Ecological momentary assessment tracks patients’ mental health outside the clinic.

SMARTPHONES, SMART INTERVENTIONS

As a clinical psychology PhD student, Dan Fulford wanted to understand what happened to patients with serious mental illnesses, like schizophrenia, outside the clinic and lab. Using a technique called ecological momentary assessment (EMA), he began collecting data from study participants repeatedly during their day. To do that, he used the latest in mobile technology at the time: the Palm Pilot.

Now an associate professor of occupational therapy, Fulford still uses EMA—but in a far more sophisticated manner. His study participants use their smartphones to track their precise locations, phone conversations, text messages, and other app usage—millions of lines of data that Fulford hopes hold

the answers to not only *when* people feel lonely but also how interventions can be sent by phone in real time to help them.

“Technology is something that will provide opportunities to supplement and extend the support that you get in a one-on-one psychotherapy session,” Fulford says. But to realize that goal, he first needs to get a better understanding of which data are reliable and significant, and how to translate that into interventions, a labor-intensive process that may eventually use machine learning or artificial intelligence. “If we can use that data in a predictive model, that would allow us to provide the opportunity for an individualized intervention for that person.”



Wearable sensors allow volunteers to participate in studies from home.

JON LAVALLEY; COURTESY OF CLARIO

REMOTE TRIALS, RELEVANT DATA

Deepak Kumar, an associate professor of physical therapy, was preparing a study of exercise-based physical therapy treatments for knee osteoarthritis when the pandemic forced him to change plans. Kumar and his team typically collected movement data from participants in their lab, but they had to supplement that data using remote sensors that recorded additional measurements at home. The results surprised them.

Kumar noticed that some participants showed improvements in their movement in the lab but not at home, suggesting that they weren’t walking in a natural manner during the lab visits. “The outcome we’re collecting at home is potentially giving us more relevant information about [a participant’s] condition,” he says.

Buoyed by his findings, Kumar launched via telehealth a fully decentralized study—a trial that takes place outside of a typical clinical setting—of the safety and feasibility of mindfulness and exercise interventions. Participants from more than 20 states were recruited online and provided with motion-tracking sensors. A follow-up project recently received funding from the National Institutes of Health.

Decentralizing studies is a potential win-win, Kumar says. Done well, they can increase access to participants and provide more relevant data to researchers. ■

Web Extra

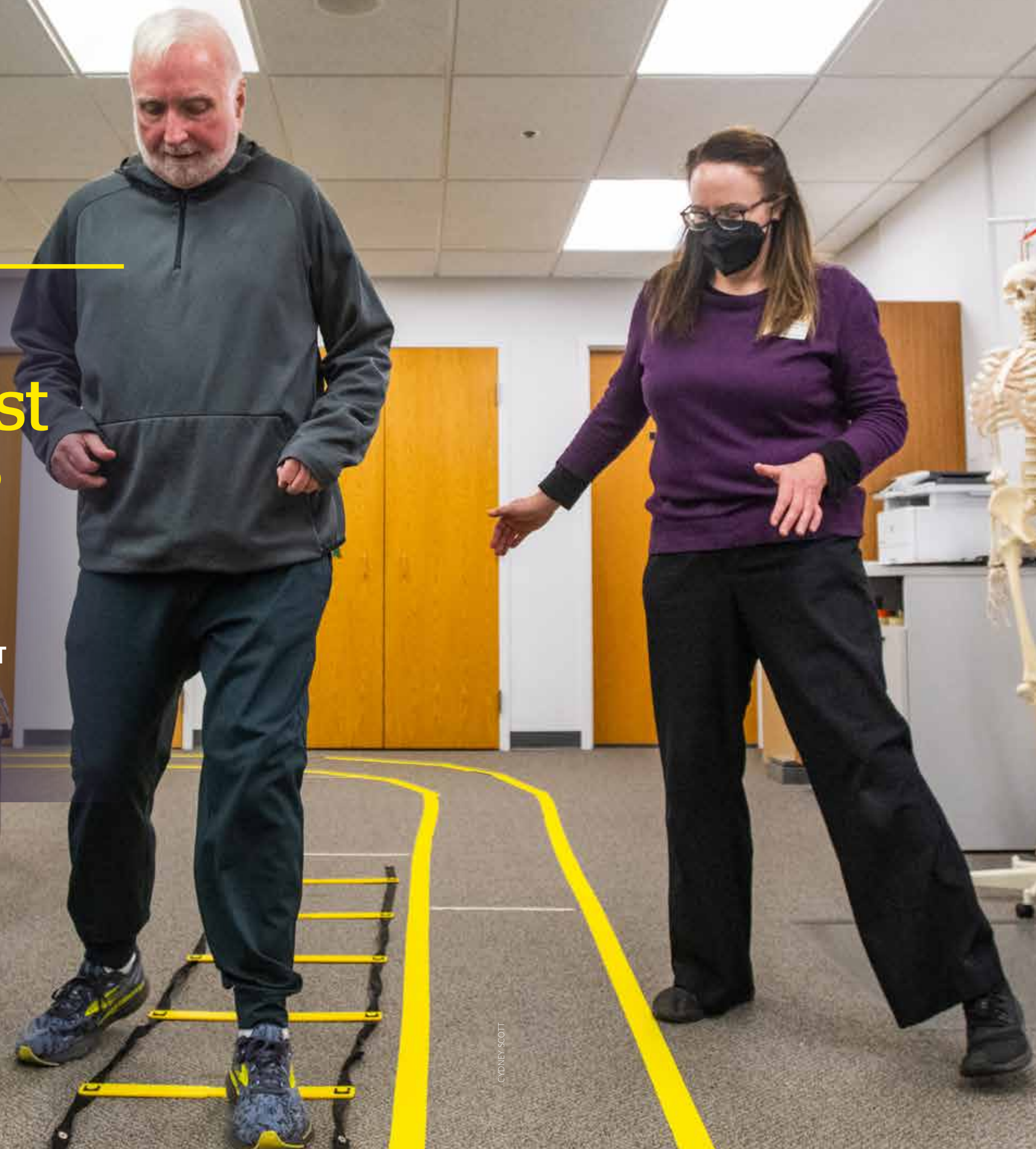
Read about more digital therapy tools Sargent researchers and centers use at bu.edu/sargent/inside-sargent.

Fighting Back Against Parkinson's Disease

VOLUNTEERS AT THE CENTER FOR NEUROREHABILITATION ARE KEY TO TWO PARKINSON'S TREATMENT BREAKTHROUGHS

BY ANDREW THURSTON

Retired psychologist Ed Hattauer says working with clinical research physical therapist Teresa Baker at the BU Center for Neurorehabilitation always fills him with "a sense of hope."



CYDNEY SCOTT



Former BU laboratory engineer David Campbell was diagnosed with Parkinson's just weeks after retiring in fall 2020.

About three years before he retired, David Campbell noticed something weird happening as he typed. Whenever he tried to hit a letter, say “a,” he’d get “aaa,” like the keyboard was jamming or his finger was triple-tapping the key. That wasn’t the only thing that seemed off—his sense of smell was faltering. “Little things,” he says, “that I didn’t think of as being a big deal.”

A couple of weeks after he retired in fall 2020, Campbell learned the little things weren’t so little—they were life-changing. He was diagnosed with Parkinson’s disease. The repeated “a” was caused by a slight tremor as nerve cells in his brain degenerated or died, interrupting the signals controlling his muscles. A tremor is many patients’ first Parkinson’s symptom, followed by a raft of other steadily worsening neurological issues, such as a quieter voice, slower movement, stiffer limbs, and tighter facial expressions. Almost all patients will experience some loss of smell too.

Although therapy and medications can bring some relief from the neurodegenerative disorder, there’s no cure. Somewhere between 500,000 and 1 million Americans have Parkinson’s, including actor Michael J. Fox, singer Neil Diamond, and civil rights activist Jesse Jackson.

For Campbell, it was a pretty shabby retirement gift. As he tried to adjust to his new reality, the former Boston University laboratory engineer joined a support group and decided to volunteer for research studies that aim to improve treatment—perhaps even plot the route to a cure. “I figured, I have the disease,” he says, “I might as well try to do something good with it.”

That decision is already having an impact. With the help of volunteers like Campbell, researchers at Sargent’s Center for Neurorehabilitation, a hub for Parkinson’s research, education, and clinical care, have made two important advances that may help people with the disease walk more smoothly, even turn their shuffled steps into confident strides. In one study, they used wearable soft robotic apparel—a series of fabric wraps, cables, actuators, and sensors—to help patients walk farther and faster. A second study used a music-based technology to increase walking duration and distance—controlling a song’s beats per minute to keep the steps up.

The center has been at the forefront of research establishing the benefits of exercise and physical therapy in taming the disease’s impact and improving quality of life. And both of the newly tested therapies could find their way into patients’ everyday lives relatively quickly. The robotic device uses technology that’s already commercially available; the musical intervention uses store-bought headphones. But, says Center for Neurorehabilitation director Terry Ellis, professor and chair in the physical therapy department, without the volunteers who give up hours of their time to participate in research studies or help her team test ideas and tweak gadgets, none of it would be possible.

That’s a story told across BU. Volunteers join research studies—as well as classroom discussions and clinical training programs—on a wide range of topics, participating in person or from home. Some even do it over decades, like those who’ve given their time to the long-running Framingham Heart Study and BU’s Black Women’s Health Study.

“Most of our research is intervention studies, so there’s hypothetically some benefit for them,” says Ellis of her center’s work. Their fitness may improve, they may get to try out some symptom-relieving tools. “But without them, we couldn’t do the work. I’m always saying to [volunteers], the work wouldn’t exist without your participation and contribution.”



Terry Ellis

ELIMINATING FREEZING OF GAIT

Being a research study guinea pig can be rewarding, and might even save or improve lives, but it’s hardly glamorous work. For most of the robotic apparel study, the main volunteer (unnamed in the final paper to protect his privacy) spent his time walking back and forth—again, and again, and again. At first, it was to get a baseline of his walking ability, then to allow the researchers to monitor the robotic tech’s effectiveness at shifting his stride and fine-tune the technology.

The patient, a 73-year-old male who’d been diagnosed with Parkinson’s 10 years earlier, was struggling with a common Parkinson’s problem known as freezing of gait. During a freezing episode, thought to be caused by a malfunction in the brain’s locomotor circuitry, a patient’s stride shortens, their walking speed tumbles, and their muscle coordination falls out of whack. Then they just stop—it reportedly feels like their feet are glued to the floor. Things had gotten so bad for the patient working with Ellis—more than 10 freezing episodes a day, resulting in multiple falls—he’d taken to getting around on a kick scooter.

“It’s just devastating,” says Ellis (CAMED’05). “There’s really no medicine or surgery that improves this. It interferes tremendously with people’s everyday life.”

She and her colleagues had tried wearable robotic apparel on people recovering from a stroke—finding it helped some regain their prestroke walking speeds—and wondered if similar technology might work for Parkinson’s too. That exosuit, which is now commercially available for stroke rehabilitation from medical device company ReWalk Robotics, was derived from a model developed for the military by Harvard University’s Bidesign Lab to increase service members’ endurance.

CYDNEY SCOTT

CYDNEY SCOTT



“As an old-time PhD researcher, I really relish in the importance of doing research, but research that’s very practically oriented toward helping people do things.”

—Ed Hattauer, clinic volunteer



Watch a video about Hattauer’s journey from diagnosis to research volunteer at bu.edu/brink.

In most iterations, the robotic apparel looks like a highly engineered sports brace, using an algorithm to drive motors and cables that strategically apply forces to supplement muscles and joints. The version the researchers tailored for the Parkinson's study featured two bands: one around the waist, the other around the thigh, each connected by a spooled cable. When activated, the spool turns, retracting the cable and pulling the thigh up. Ellis calls it a mechanical assist: "It provides a little bit of force—it's perceptible, but at a very low level." The algorithm helps time the assistance to the users' steps and tailor the amount of force needed.

As the study progressed, the researchers put their volunteer through his paces with a range of different tasks, including timed walking tests in the lab and outside in the community, adjusting the force provided by the suit—and its timing—and assessing the biomechanics of his walking.

The results were striking: when the suit was on, the volunteer strolled easily down the corridor, arms and legs swinging with a natural confidence; when it was powered down, the change was almost instant—he staggered, stumbled, shuffled, and grabbed at the wall for balance.

When switched on, the robotic apparel eliminated his freezing of gait—the first time any study has shown a potential way to overcome the debilitating symptom. The findings were published in *Nature Medicine*.

“What are you going to do with this disease? Are you just going to sit back or are we going to jump in? I want us to do more to wipe this thing out. I think it's time.”

—Ann Greehy

"It's pretty amazing," says Ellis, who collaborated with researchers from BU and Harvard University. "We think we're driving an increase in step length and that's preventing the shortening of the steps that leads to freezing. In future, we envision you could wear this like underclothes." Her coauthors include Conor Walsh, a Harvard University professor of engineering and applied sciences; Franchino Porciuncula, a Sargent research scientist; and Jinsoo Kim, a Stanford University postdoctoral scholar and recent Harvard PhD student.

The researchers even did an informal test outside the study, letting the volunteer take the apparel for a spin at home. "And he did pretty well," says Ellis. "There were certain tight spots where it didn't work as well as we would want, so we talked about playing with the algorithm to make it work better."

This was just a small study with one patient, so the next stage would be scaling the project up with more volunteers. But Ellis says because the base technology is already commercially available through ReWalk, there aren't many barriers to getting the suit into clinics. She pictures a near future where a patient visits a physical therapist, their walking is assessed, and they get robotic apparel tailored for their needs. Even without the tech, the team's findings on the biomechanics of freezing gait may help therapists better target treatments to combat it.

WALKING TO THE BEAT IMPROVES QUALITY OF LIFE

Another volunteer being helped to hit her stride is Ann Greehy. A former school guidance counselor, she was diagnosed with Parkinson's in 2015 and began volunteering at Sargent three years later. Her most recent contribution was as a volunteer on a project examining the use of music as a walking aid.

In a 2023 study published in the *Journal of Parkinson's Disease*, Ellis and Porciuncula found they could use a song's beats per minute to help people increase their gait speed and stride length, and cut out variability in their walking patterns. Greehy was one of those who'd helped them assess the technology.

During the study, researchers placed sensors in subjects' shoes to monitor their gait and gave them an Android device loaded with a music software app. The proprietary system, which uses a technique known as rhythmic auditory stimulation, plays music with beats per minute tailored to a patient's natural walking cadence, helping them gradually increase their pace session by session; all the participants were asked to plug in their headphones and walk for 30 minutes, five days a week.

"It was amazing when the beats started—it was a whole new experience," says Greehy. "You put your shoulders back and you're up walking."

After four weeks of using the system, which was developed by neurorehab company MedRhythms, the 23 study participants had similar experiences to Greehy (read more about MedRhythms' InTandem therapy, now commercially available with a prescription, on page 4). The researchers found that, compared to baseline, they had higher rates of daily moderate intensity walking (up by an average of 21.44 minutes) and more steps (up by 3,384 steps). In the paper, they noted "quality of life, disease severity, walking endurance, and functional mobility were improved after four weeks."

"People with Parkinson's can't move automatically—they have to think about the movement," says Ellis, who collaborated on the study with researchers from the University of New England, Johns Hopkins University, and MedRhythms. The part of the brain, the basal ganglia, that sends the signals that help people walk without deliberate thought is dysfunctional. "You can't possibly keep that level of attention to the task of walking, so we were trying to figure out how to provide an external signal if the internal signal is not working."

The music provided that signal—in the same way your workout playlist gets your feet moving on the gym treadmill. "You're not thinking, 'Oh, I want to run to the beat of the music,'" says Ellis. "It just happens, and so it takes a lot less cognitive energy."

After a career as a school guidance counselor, Ann Greehy loves working with Sargent students and supporting research.



MAKING SENSE OF LIFE WITH PARKINSON'S

Greehy says one of the highlights of the music study was making Ellis' students laugh by sharing her favorite track: rapper Flo Rida's "Club Can't Handle Me." They were "on the floor laughing at this old lady who likes Flo Rida," she says. Like Greehy, many of the volunteers also come into BU to work with students, sitting in on classes and panels, talking to them about living with Parkinson's disease, answering their questions, and giving them a chance to practice their care skills. Some volunteers also attend the Center for Neurorehabilitation as a patient, receiving physical therapy services.

"Our research and clinic are one and the same," says Ellis. "That chasm that can exist between research and clinical practice doesn't exist here. The questions we try to answer with research come from our interactions with patients in the clinic—it's their challenges and problems that they bring to us that make us curious about how to solve them." And when they find a solution, they take it straight into the clinic.

Another of the music study volunteers and clinic patients, retired psychologist Ed Hattauer, appreciates that focus on making lives better—including his own. "As an old-time PhD researcher, I really relish in the importance of doing research, but research that's very practically oriented toward helping people do

things." Hattauer says that when he comes to the center, there's "really a sense of personal caring that gets communicated. And I think what I carry away is a sense of hope. It helps sustain my hope and my feeling of emotional connection."

Greehy says there are a bunch of factors that keep her coming back: "I've gotten so much out of this it's not even funny." She loves working with students, she gets great tips from the therapists about maintaining her hobbies, like gardening, and she feels good being part of the push for a solution to the disease. Most important, volunteering has helped her make sense of life after her diagnosis.

"What are you going to do with this disease?" says Greehy. "Are you just going to sit back or are we going to jump in? I want us to do more to wipe this thing out. I think it's time."

Like other volunteers, Greehy knows the disease probably won't be cured in her lifetime, but it won't stop her trying.

"I don't know if they'll find a cure for me necessarily," says Campbell, "but I've been around research and development my whole life and it feels good to contribute in whatever way possible. I could just sit at home and wallow in pity and do nothing, but it feels proactive to go out and make an effort to advance the science." ■

A STEP AHEAD

DONNA JOAN ASTION ('82), WHO'S HAD A SUCCESSFUL CAREER IN ORTHOPEDICS, FOUND HER FOOTING AT SARGENT

BY STEVE HOLT

As Donna Joan Astion took her seat at the end of a long board table, 10 men stared at her. The year was 1988. The Sargent graduate was in the fourth year of medical school at New York's Mount Sinai School of Medicine (now the Icahn School of Medicine at Mount Sinai), and she was interviewing for residencies in a male-dominated field: orthopedic surgery. Suddenly, one of the men on the residency interview committee slammed his hand on the table and addressed Astion ('82): "You're a woman!" he yelled. "Why the hell do you want to go into orthopedics?" As the interview concluded, another man spoke up: "I'm the admissions director of an all-men's club, and you want to join. What do you have to say to me that will convince me that you should join our club?"

"If that's your attitude," Astion told the residency board, "then I have no interest in joining." She never ranked that program in the residency match.

Sargent lay the academic groundwork for Astion to excel in medical school and a career as a doctor, and more than three decades later, in 2020, she retired from practicing foot and ankle orthopedics in New York City. In her roles on Sargent's Dean's Advisory Board and the board of trustees at Brooklyn's Maimonides Medical Center, Astion hopes her involvement and leadership have made it easier for young women to enter medicine than what she experienced.

A WOMAN IN ORTHOPEDICS

Astion knew early on she wanted to become a doctor. Her parents—neither of whom had been to college but valued education—and a guidance counselor urged her to pick an undergraduate major that would lead to a job right out of college. As a physical therapy major at Sargent, Astion found community and purpose in the classroom and the athletic training room, which is where she spent many of her post-class and weekend hours. She worked with athletes from all the Terrier teams, including football, but women trainers didn't travel with the men's teams for road games back then. "I got used to being around locker room talk and the 'men's club,'" Astion says. "I learned to hold my own there."

After graduation, Astion decided to pursue her interest in medicine and took additional classes at BU necessary to apply, while also working a job as a physical therapist. She was accepted by several medical school programs and chose to enroll at Mount Sinai. Astion chose to build on her Sargent training and experience as a physical therapist and athletic trainer, applying for residency programs in orthopedic surgery. She didn't think twice about popular wisdom at the time that women weren't cut out for the physicality of orthopedics—and wasn't put off by the treatment she received from some men on the interview circuit. "I wasn't out to prove anything," she says. "I just thought orthopedic surgery was a great fit for me." Case Western Reserve (now University Hospitals of Cleveland), one of the top orthopedic residencies in the country, ranked Astion highly, and she completed her orthopedics residency there.

Astion pursued a fellowship specializing in orthopedic problems of the foot and ankle. The fellowship allowed her to continue her training and research with several doctors at top-ranked Hospital

for Special Surgery and at Roosevelt Hospital (now Mount Sinai West), where she worked with famed "doctor to dancers" William Hamilton treating performers with the New York City Ballet and American Ballet Theatre.

As a foot and ankle specialist, Astion served communities in New York and Connecticut, continuing her work with dancers and other athletes. While taking some time away from her orthopedic practice following the birth of her second child and arrival of a teenage stepdaughter to her household in 2004, Astion pursued (and earned) a master's in public health from Columbia University's Mailman School of Public Health. She returned to orthopedic practice in 2012, mainly seeing patients seeking second or third opinions, as well as patients who wanted to explore non-operative solutions to their foot pain. "I enjoyed helping people understand what their problem was and the different ways their issue could be managed," Astion says.

"I WASN'T OUT TO PROVE ANYTHING. I JUST THOUGHT ORTHOPEDIC SURGERY WAS A GREAT FIT FOR ME."

SERVING IN RETIREMENT

The COVID-19 epidemic slowed the number of patients seeking orthopedic treatment substantially while increasing her responsibilities at home with two daughters and two stepdaughters isolating with her and her husband. Astion decided it was a good time to retire from her foot and ankle practice. But since then, she hasn't slowed down much.

Astion helped guide Maimonides Medical Center, an epicenter of the tumultuous first months of the COVID-19 pandemic serving a lower- and middle-income population, plan and execute through the crisis. She chairs Maimonides' quality and safety and academic affairs committees, working closely with doctors and administrators. As a member of Sargent's Dean's Advisory Board since 2005, Astion is able to give back to the community that helped spark her successful career. Astion and husband Michael F. Fricklas (LAW'84)—a member of the University's Board of Trustees and a member of the BU School of Law Dean's Advisory Board—are also significant donors to the University, Sargent, and the School of Law, and are members of the University's Warren Society. It's a position that gives Astion a perfect vantage point to cheer on the students who are pursuing careers in medicine.

"It is wonderful to see so many women being successful in medicine and specifically in orthopedic surgery now," Astion says. "You don't have to be a jock. You don't have to be super strong. You need to know techniques and know how to diffuse tension with a good sense of humor." ■

PREPARED FOR THE FUTURE

BIOMEDICAL EXECUTIVE CRISTIN TAYLOR ('04) IS THE NEW CHAIR OF SARGENT'S CLINICAL ADVISORY BOARD

MARA SASSOON

When Cristin Taylor was in high school, she spent summers training with the Rochester (N.Y.) City Ballet, dreaming of becoming a professional dancer one day. That changed the summer before her senior year, when she injured her spine.

Despite working with an athletic trainer and a physical therapist, Taylor “wasn’t really able to ever fully recover in that time,” she says. “So, I had a bit of a late shift in my mindset about where I was going and what I wanted to do.” Taylor ('04) was fascinated by what her trainers and PTs were doing to help her recover. “I thought I could really enjoy working with athletes and helping people achieve their rehabilitation goals,” she says, “just like these people had done with me.”

It was the first of many strategic pivots throughout Taylor’s successful career, each uncovering new opportunities. Now, as a medical director for a \$5 billion medical device company and the new chair of Sargent’s Clinical Advisory Board, she brings her expertise as a physical therapist and biomedical executive to help prepare students for the future of healthcare and to amplify Sargent’s prestigious reputation.

MORE TURNING POINTS

Taylor enrolled at Sargent to study athletic training. While there, she developed an interest in adaptive sports and rehabilitation. “It was a real turning point in my life,” she says. Sargent was also where she developed the innovative mindset that prepared her to take on an array of exciting opportunities that have intersected the fields of physical therapy, medicine, and biomedicine.

After Sargent, she went on to pursue a Doctor of Physical Therapy at the University of Miami to gain more experience in adaptive sports and amputee rehabilitation. She then took her training in amputee rehabilitation to the Walter Reed Army Medical Center in Washington, D.C., where she worked as a physical therapist. Her next career shift led her to study to be a physician’s assistant at the George Washington University. Upon graduation, she gained exposure to clinical research in her new position as a PA in orthopedic oncology at Baltimore’s Sinai Hospital. Taylor found she could bring much of what she learned at Sargent and from her PT training to that role.

“I wound up working with adults and children throughout their operative journey in treatment and was able to leverage quite a bit of my experience in wound care, prosthetics, and rehabilitation from my work as an athletic trainer and physical therapist to better serve our patients,” she says. “I think that education made me a more holistic practitioner in that field.”

FROM CONSULTING TO THE CLINICAL ADVISORY BOARD

In late 2015, Taylor was back in Boston working as a PA to the chief of sports medicine at Brigham and Women’s Hospital. But she missed the clinical research she’d grown to love at Sinai.

It was time for another career change, this time to the Andover, Mass.-based medical device manufacturer Smith & Nephew. As a global clinical strategy lead for its sports medicine franchise,

Taylor was involved in getting medical devices approved for patient use in the US, Europe, and Asian countries. After a brief stint consulting for an in-vitro diagnostics company, she moved into the artificial intelligence field, leading the clinical affairs organization at PathAI, a Boston-based company that is developing algorithms for use in digital pathology.

“HOW CAN WE TOGETHER ADVISE THIS NEXT GENERATION OF STUDENTS WHO ARE ENTERING INTO A WORLD TO BE FURTHER IMPACTED BY ADVANCES IN TECHNOLOGY AND ARTIFICIAL INTELLIGENCE?”

Today, Taylor is the senior medical director in the advanced wound care division at the global medical technology company Convatec, which earned more than \$2 billion in revenues in 2023. She and her team ensure the safety and efficacy of Convatec’s wound care products, including designing clinical studies. She also oversees Convatec’s global medical education that provides healthcare professionals with the knowledge and skills necessary to use specific devices to improve patient outcomes in their clinical practice.

And as of March 2024, Taylor brings her vast knowledge to Sargent’s Clinical Advisory Board as its chair. The 12-person board provides guidance on clinical instruction at Sargent and serves as a forum for discussion about policy and advocacy issues that are most impacting patients. “Sargent has really set the bar for excellence in education for rehabilitation sciences,” she says. “How can we together advise this next generation of students who are entering into a world to be further impacted by advances in technology and artificial intelligence?”

One consideration she has is boosting collaboration with other areas of Boston University, such as the Center for Computing & Data Sciences.

Taylor points to the diversity of Sargent’s community as one of its greatest strengths. “We have diversity of thought, diversity of specialty,” she says. “The Clinical Advisory Board is a reflection of the diversity of the Sargent community, and everyone’s united in this vision to improve healthcare. It’s an honor to be a part of that group and think about how to best clinically prepare students for the future of health and rehabilitation sciences.” ■

Faculty in Print



Scan to view the full list of faculty research and publications.

OUR FACULTY'S RESEARCH REACHES AUDIENCES ACROSS THE GLOBE. HERE'S A SELECTION OF PUBLICATIONS AND ARTICLES BY BU SARGENT COLLEGE FACULTY IN 2023-2024.

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Generous beyond Measure

THROUGH THEIR LEADERSHIP AND CHARITABLE GIVING, SARGENT PARENTS AND PHILANTHROPISTS MARLA AND LARRY GILBERT HAVE MADE A DIFFERENCE IN MULTIPLE ORGANIZATIONS—INCLUDING BU

BY RACHEL FARRELL

Marla and Larry Gilbert grew up steps from each other in Highland Park, Ill., a quaint and leafy suburb just north of Chicago. But they didn't cross paths until Marla was 30 and Larry was 26, when Larry's sister set them up on a blind date.

On that date, they connected quickly—and not just because of their shared upbringing in Highland Park. “We realized we both had experienced a tragedy,” Marla recalls. “My eldest sister had passed away 10 years prior, and Larry’s niece had passed away a year earlier. We had similar feelings about it, and it allowed us to connect in a way that was different.”

They also had a similar outlook stemming from those experiences. “Through mourning, we found that helping others had a positive impact on us and the organizations that benefited from that experience,” Marla says. They were married within a year.

GIVING TO CAUSES THEY CARE ABOUT

In the decades since, the Gilberts have lived out these values in admirable ways. In between raising two daughters, Maddie and Taylor, and growing their careers (Marla is an interior designer; Larry is a wealth advisor), they’ve generously donated time and money to organizations they care about. These include Impact Grants Chicago, The Art Center Highland Park, Hubbard Street Dance Chicago, the United States Holocaust Memorial Museum, and the Starlight Children’s Foundation. They’ve also been particularly supportive of Boston University.

Marla and Larry weren’t engaged with BU until their older daughter, Maddie (’22), applied early decision to the University. “Maddie said, ‘This is where I really want to go,’” Marla says. “She was the one who put BU on our radar.” Eager to support her daughter, Marla volunteered to serve as the Illinois parent representative for the BU Parent & Family Programs. She and Larry also hosted a meet-and-greet for 80 new families from across the state before the fall semester began.

DEEPENING THEIR TIES TO BU

During her freshman year, Maddie decided to transfer from the College of Arts & Sciences to Sargent College of Health & Rehabilitation Sciences, where she could major in human physiology. The experience was so positive that Marla and Larry felt compelled to step up their involvement in BU. “Larry and I immediately loved the embrace of Sargent,” Marla says. “It felt like a family: very personable and very welcoming.”



Soon, Marla was invited to join Sargent’s Dean’s Advisory Board (as one of only two non-alumni on the board), while Larry joined what is now the University Advisory Board. They started making anonymous gifts to Sargent, Hillel, and the Student Life Fund, including a large, unrestricted gift to finance the purchase of an Anatomage Table for Sargent’s Gross Anatomy Lab. The table, which looks like an oversized iPad, provides 3D anatomy visualization and functions as a virtual dissection tool for anatomy and physiology students. It proved invaluable for Sargent students during the pandemic, which began during Maddie’s sophomore year.

“Maddie called us and was talking about it,” recalls Marla. “She said, ‘You will not believe what we’re using in my anatomy course.’ It was a great tool for her to have during COVID.”

CONTINUING A LEGACY OF GIVING

Through their philanthropy, the Gilberts are continuing a legacy of giving that their parents began. Marla’s mother, for example, was an active volunteer in the Chicago chapter of Ronald McDonald House Charities, which supports and houses families with sick or injured children. She stumbled upon one of the houses while grieving the loss of Marla’s sister and decided to put her energy toward helping the families living there. For the next 18 years, Marla’s family would drive down to the house every Christmas and hand out food and presents.

“We would give Christmas to people who were going through a difficult time and wouldn’t normally have a Christmas,” Marla explains.

Today, although Marla and Larry don’t share the details of their charitable giving with Maddie and Taylor, they hope to model the importance of philanthropy so the legacy of giving continues. “We’ve tried to raise them to accept everybody,” Marla says, “and always help other people.” ■

COURTESY OF MARLA AND LARRY GILBERT

BU Sargent College

U.S. News & World Report Best Graduate School Rankings

Our graduate programs are officially among the nation’s best—Sargent programs tracked by *U.S. News & World Report* all rank among the best in their respective fields:

- 1** Occupational Therapy Program ranked number 1 (tied) out of 263 programs
- 5** Speech-Language Pathology Program ranked number 5 (tied) out of 280 programs
- 11** Physical Therapy Program ranked number 11 out of 245 programs

National Certification Board Exam Overall Pass Rates

- 100%** NUTRITION*
- 99%** OCCUPATIONAL THERAPY
- 98%** PHYSICAL THERAPY**
- 98%** SPEECH-LANGUAGE PATHOLOGY

Percentage of BU Sargent College students in entry-level graduate professional programs who passed their certification exams (data averaged over the past three years).

*Within one year of completing the program, per ACEND requirements
 **Data averaged over the past two years, per USDE requirements

Boston University Sargent College of Health & Rehabilitation Sciences has been advancing the health and well-being of members in our communities for more than 140 years. Our learning environment fosters the values, effective communication, clinical skills, and transformative research that distinguish outstanding health professionals, leaders, and care. We continuously enhance our degree programs to meet the future needs of our students while advancing the latest research. Our curricula include hands-on training in and outside of the classroom, including fieldwork, providing students in every degree program with experiences in clinical and community settings. We have established partnerships with more than 2,500 healthcare facilities across the country and around the world including our own on-campus outpatient clinical centers that offer a wide range of services here in Boston. These integrated clinical research centers accelerate how we research and transform practice and education.

Areas of Study

- Behavior & Health
- Health Science
- Human Physiology
- Nutrition
- Occupational Therapy
- Physical Therapy
- Rehabilitation Sciences
- Speech, Language & Hearing Sciences
- Speech-Language Pathology

Distinctive Programs

- Combined BS and MPH in Public Health
- Combined BS in Health Studies and Doctor of Physical Therapy
- Combined BS and MS in Human Physiology
- Joint Bachelor of Science in Linguistics and Speech, Language & Hearing Sciences
- Combined Doctor of Occupational Therapy/PhD in Rehabilitation Sciences
- Combined Doctor of Physical Therapy/PhD in Rehabilitation Sciences
- Fellowship in Orthopaedic Manual Physical Therapy
- Neurological Physical Therapy Residency Program
- Orthopaedic Physical Therapy Residency Program

Sargent Integrated Clinical Research Centers

- Academic Speech, Language & Hearing Center
- Aural Rehabilitation Services
- Center for Stuttering Therapy
- Cognitive Health and Rehabilitation Programs
- Language, Literacy, Preschool, and Social Communication Programs
- Preschool Summer Intensive Language Intervention Program
- Speech Sound Disorders Program
- Voice and Swallow Programs
- Aphasia Resource Center
- Center for Neurorehabilitation
- Center for Psychiatric Rehabilitation
- Physical Therapy Center
- Ryan Center for Sports Medicine & Rehabilitation
- Sargent Choice Nutrition Center



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Boston University Planned Giving

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