

2023-2024

InsideSargent

Boston University College of Health & Rehabilitation Sciences: Sargent College

Big Science *for* Little Ones

Sargent welcomes internationally renowned
child development expert Jana Iverson



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a quest to unlock the
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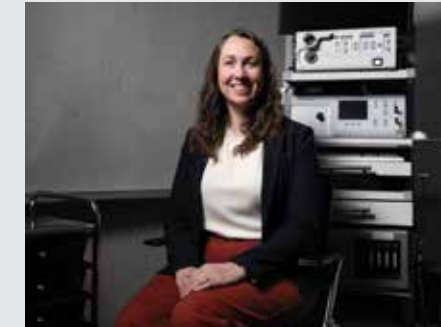


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About
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Dean's Message



Hello everyone,

I am honored and humbled to have been appointed as the new dean of Sargent College. Sargent is a world-renowned community of scholars, researchers, clinicians, and more, all working to advance the education and practice of health and rehabilitation sciences. I feel incredibly fortunate to be part of this inspiring mission.

As a researcher focused on workplace safety and employee health, I understand how important it is to create an environment where colleagues and students can do their best work. Throughout my career, I've strived to improve worker safety, health, and well-being through organizational policies, programs, and practices. It's very exciting for me to draw from this expertise in my new role at Sargent.

I want to thank Dean Christopher Moore for his steadfast leadership and many years of service to the college. You can read about the many achievements of "The Moore Legacy" in this issue (page 10), including increasing graduate student enrollment and research funding, compiling an outstanding leadership team, faculty, and staff, and investing heavily in junior faculty to ensure their legacy at Sargent. He leaves Sargent well-positioned for continued success.

I hope you find as much pride and excitement in this and the many other stories of impact and innovation featured in this edition of *Inside Sargent*. When I applied for the dean's position, I drew inspiration from Boston University's mission statement: "We remain dedicated to our founding principles: that higher education should be accessible to all and that research, scholarship, artistic creation, and professional prac-

tice should be conducted in the service of the wider community—local and international." The stories in this issue demonstrate the dedication to and modern expression of that vision by our students, alumni, faculty, and staff—and their dedication to improving the well-being of individuals across their lifespan.

Sargent College, through research, teaching, and practice, supports the well-being of all communities, recognizing that belonging, inclusion, and equity are at the core of community and health. My goal in this first year as dean is to listen and learn, to get to know our community—including students, alumni, parents, faculty, staff, and the communities we serve. I am excited to hear your ideas and your vision as we begin to renew Sargent's Strategic Plan and co-create a shared path forward that builds powerfully on the momentum of all that's been achieved and the promise of what can be. Until then, thank you for your continued support.

I'm excited for what comes next!

Yours always,

Jack Dennerlein
Dean and Professor

Web Extra

Read more about Jack Dennerlein's scholarship and appointment as dean at bu.edu/today.

CYDNEY SCOTT

A HOLISTIC APPROACH TO DEI

SARGENT AIMS TO BE A LEADER IN DIVERSITY, EQUITY, AND INCLUSION

LAURA DRISCOLL BEGAN LEADING DIVERSITY, EQUITY, AND INCLUSION (DEI) efforts at Sargent in 2018 and has worked to establish the college as a leader in the field.

"We have a pretty special community at Sargent," says Driscoll, a clinical assistant professor of physical therapy. "Most of the people are active healthcare providers who have a moral compass pointed toward equity." That, Driscoll adds, has made it easier to enact change.

As director of faculty diversity and inclusion, Driscoll is helping the college address DEI holistically. That includes reviewing graduate admissions processes and revising the core curriculum. Faculty have been taking advantage of new BU DEI programs, and students are driving challenging conversations.

Driscoll and Vincent Stephens, associate dean for diversity and inclusion at BU's College of Arts & Sciences, conducted a DEI strategic planning session in September 2022, out of which came plans for the college's Inclusion Catalyst Committee. Stephens and Driscoll presented their work at the 2023 NCORE (National Conference on Race & Ethnicity in Higher Education). "To be able to have Sargent in a place like this within higher ed, looking at how we can do this in the right way, is really exciting," Driscoll says of the conference.

Inside Sargent spoke with Driscoll about the college's progress in creating a more diverse, equitable, and inclusive school.

CHITOSE SUZUKI

Inside Sargent: What is your goal as director of faculty diversity and inclusion?

Laura Driscoll: We want our healthcare workforce to reflect our community, and in allied health, it currently doesn't. It's still a very predominantly white space—and actually, it's mostly white women. We need to be thinking about student recruitment, admissions, and support for students when they get here, and faculty and staff recruitment and retention in different ways.

What do you think Sargent's biggest success has been thus far?

The removal of the GRE requirement in 2019 is one. Even publishing an average GRE score on a website deters people from applying. Just by removing the GRE, we've increased the diversity of our applicant pool. Holistic admissions is an evolution. The removal of the GRE felt huge, but that was just a starting point.

What does a holistic admissions process look like?

We've changed how we're ranking and grading applications, and we're training people to look at them in the least biased way. In physical therapy, typically we required letters of recommendation, essays, grades, and life experiences. The faculty decided what we were looking for in people's personalities, and we favor a holistic view over a quantitative score. We also de-emphasized the big essay because you don't need to be a writer to be a physical therapist—and oftentimes people with more privilege have lots of help with those essays. We now also



Laura Driscoll works with Sargent's faculty to train a healthcare workforce that is both more reflective of and sensitive to America's diversity.

ask applicants to write short answers to questions targeting the skills and personality traits that we're looking for. And we pay for an online interview service, so we've removed the financial barrier of flying to Boston.

You mentioned the goal of making the allied health professions more diverse—what can people already in these professions do?

White people must be engaged in this work, period. There's been a lot of work to allow faculty to have these conversations, to give space to make mistakes and to recognize that we are learning together.

We also have faculty who have been working on their own skills. Faculty from Sargent were chosen for the first cohort of BU's Designing Antiracism Curricula Fellowship and the first BU

Inclusive Pedagogy Institute. That was awesome because then they brought all of that knowledge back to the rest of us.

So much attention in diversity and inclusion work is focused on race, but Sargent has also introduced *Disability Visibility* [Alice Wong, ed., Knopf Doubleday, 2020] to the undergraduate core curriculum. How do you approach inclusion holistically?

My core belief is that there's no hierarchy to oppression. Whether you're looking through a disability lens or an antiracist lens, it's all the same concepts of seeing people where they are, providing them what they need to succeed, and making sure you're trying to understand difference and

not assimilate. The root of disability is society thinking somebody's better or stronger or more important than somebody else—it's the same core principles in racism.

Sargent now has a Social Justice Learning Club—what inspired its creation?

This started in 2020 when PT students were supposed to be in their clinical internships that had been canceled by COVID. We were thinking of opportunities to give to them to stay engaged, and there were a couple of students who wanted to focus on social justice issues. It started on Zoom, as a brave space for some real discussion about racism. It grew from there.

What else is happening at the student level?

They're brilliant and they have all the ideas, so I've just been mentoring and helping to connect them to the right people. There's one student who got grant funding for a textbook lending library. And all the professional programs have student organizations [such as DiverseOT]. Diversity and inclusion isn't the main mission of all of them, but everybody's focused on that right now. —*Marc Chalufour*



Read an expanded version of this interview at bu.edu/sargent/inside-sargent.

EVALUATING, LEARNING, IMPROVING

EMILY EVANS RESEARCHES HOW MEDICAL FACILITIES CAN PROVIDE BETTER HEALTHCARE

Sargent welcomed health services researcher Emily Evans to its faculty in 2022. Evans, an assistant professor of physical therapy with almost two decades of experience working with individuals with neurologic diagnoses in community-based rehabilitation settings, believes that medical facilities should continuously critically examine the care they provide so they are always making improvements.

During her postdoctoral fellowship at Brown University School of Public Health, Evans studied administrative data at post-acute care settings, such as nursing and inpatient rehabilitation facilities, to determine how the care they offered impacted the outcomes of patients with traumatic brain injuries. "We used data that is collected from these large administrative databases, which can include things like Medicare claims and mandated functional

assessments, and looked at what we could learn from the care that we provide to inform and improve future care," she says.

At BU, Evans says she is using her experience with administrative data and in clinical practice to tie her research to a model of care called Learning Health Systems (LHS), which calls for healthcare providers and health systems to constantly evaluate what they do in order to improve their services. "The concept came from the Institute of Medicine as a way to improve the quality and efficiency of healthcare, and Charles Friedman [the chair of Learning Health Sciences] at the University of Michigan has developed a really clear conceptual model [for it]. The idea is that you start with a problem that multiple communities of interest within a health system want to solve, collect data about what is currently done, learn from that data, then try to use what is learned to change the way that care is provided to address the problem."

Over the next year, Evans will work with Spaulding Rehabilitation Hospital as a Learning Health System Scholar



through the Learning Health Systems Rehabilitation Research Network. The goal of the LHS scholar program is to connect researchers with health systems and develop a collaborative relationship and plans to address the health system's priority areas for improvement.

"The wonderful and challenging thing about Learning Health Systems work is that it really is a collaboration between researchers, health systems, providers, and patients," Evans says. "I'm in the process of developing relationships with [local] health providers and health systems and look forward to working together with them." —*Mara Sassoon*

DAVE GREEN

DR. ANA VASILEVA FROM THE IPG LAB AT THE UNIVERSITY OF IOWA

I FEEL SEEN

HOW ONE PHYSIOLOGY PROFESSOR SHINES A LIGHT ON LGBTQ+ HEART HEALTH

WHEN JESSE MOREIRA STARTED TEACHING THEIR FIRST

cardiovascular physiology class to a large group of premedical students at Boston University, the clinical assistant professor soon noticed a pattern.

"I'm very vocal and open with my identities in the classroom," says Moreira ('18,'21), who is nonbinary. Queer students started coming to Moreira during office hours, sharing sentiments like, "Thank you for being authentic. It helped me feel more comfortable in the classroom space," Moreira says.

This got Moreira thinking—how might future clinicians, researchers, and medical professionals be better trained to serve LGBTQ+ patients? With research expertise in cardiovascular systems and disease, Moreira educates students on the burden of heart disease on historically marginalized communities and the full spectrum of the cardiovascular system. By increasing representation in the classroom, and enhancing students' understanding of how chronic stress from marginalization impacts heart health, Moreira works to improve patient care.

According to a growing body of research, gay men and bisexual women face higher rates of hypertension, Moreira says, and transgender Americans are at higher risk for cardiovascular disease. But LGBTQ+ populations are also largely left out of STEM (science, technology, engineering, mathematics, and medicine) research and education. Moreira coauthored a paper in the *American Journal of Physiology* on the lack of inclusion of lesbian, gay, bisexual, transgender, queer or questioning, intersex, asexual, Two Spirit, nonbinary, and gender nonconforming people in STEM, and action steps to retain scientists in physiology. The authors

point out that LGBTQ+ scientists and others in STEM fields experience more harassment during their careers and have higher dropout rates than their cisgender-heterosexual peers, likely due to lacking a sense of belonging in the field.

To address these problems, Moreira uses the classroom as a first step. Last fall, while teaching a cardiovascular pathophysiology class of about 100, Moreira conducted a study that measured how a lecture focused on disparities in marginalized communities impacted students.

In the lecture, Moreira went over the minority stress theory—which describes

“When we train more inclusive-minded scientists and clinicians, we reduce implicit bias that they hold, and possibly that will translate as better outcomes for their patients one day or better-designed clinical trials.”
—*Jesse Moreira*

how LGBTQ+ people systematically experience psychological distress—as well as basic cardiovascular science to demonstrate how stress pathways are activated from the brain to the heart. The class then worked through case studies that helped them see example patients who might have intersecting marginalized identities.

Moreira concluded the lesson with a question: What's something you can do that costs little to nothing to make a difference? Students shared ideas like community-organized spaces, where LGBTQ+ people can get their blood pressure taken, and other safe places for queer clinicians to provide peer-to-peer education. "When we train more inclusive-minded scientists and clinicians, we reduce implicit bias that they hold, and possibly that will translate as better outcomes for their patients one day or better-designed clinical trials," Moreira says.



Jesse Moreira works to make healthcare more welcoming to LGBTQ+ patients.

Moreira surveyed half the students to measure how the lecture impacted them and found significant improvement in both subjective and objective understanding related to health inequities in cardiovascular health for LGBTQ+ populations and BIPOC (Black, Indigenous, and people of color) communities. Students were able to remember and understand the information, providing a strong foundation for learning more as they continue through school.

Moreira plans to repeat the study in fall 2023 to see if the course remains effective. Eventually, they want to reach medical students through targeted lectures, class discussions, and reflection activities that involve designing new public health interventions.

On the final exam for the course, Moreira asked students about their biggest takeaway from the class. After 24 lectures covering topics from hypertension to heart failure—and just one focused on marginalized communities—almost every person wrote about marginalized communities and their unique needs. "It shows that the students were impacted by this," Moreira says. "One student wrote, 'Thank you so much for even talking about this. It feels so different to be represented in front of a classroom. I feel seen.'" —*Jessica Colarossi*

CLIMATE CHANGE, HIV, AND THE KENYAN FISH TRADE

LAWRENCE WERE TRAVELED TO

western Kenya in 2021 to conduct a livelihood and health survey in rural Migori County, where most of the population lacks access to basic services like healthcare and schools. As he made his way along the shores of Lake Victoria, he noticed how flooding had displaced fishing communities.

Were, an assistant professor of health sciences at Sargent and global health at



BU's School of Public Health, knew that these communities already had some of the highest rates of HIV and AIDS in the world, in part because of *jaboya*—fishermen trading fish for sex. Lake Victoria's fish stock has shrunk in recent years and catches have become less predictable, increasing the competition for what is caught—and incentivizing *jaboya*. Were wondered if climate change has accelerated risky sexual behavior and the spread of HIV.

"There are no studies yet that look at the intersection of climate change and transactional sex," Were says. He and colleagues from BU's College of Arts & Sciences and School of Public Health, as well as Johns Hopkins and the Kenya Marine Fisheries Research Institute, are working to change that.

To better understand the relationship between food insecurity, diminished fish supplies, and transactional sex, the

researchers conducted a survey of fishermen and fishmongers in 2022. Among their findings: as fishing seasons and fish catches change with new weather patterns, there's an increased incentive to use transactional sex until the fishing improves.

Were hopes this preliminary research will attract more funding so they can return to Lake Victoria to gather more data in Kenya and expand the study to neighboring Uganda and Tanzania. The work is urgent, he says, because the potential impacts are huge. Climate events, such as heavy rainfall, and reactions, like migration, have been linked to the spread of HIV. A 2020 study published in *Climatic Change* estimated that climate change could lead to an additional 11.6 to 16 million cases of HIV by 2050.

"We have to stay ahead of the storm," Were says. "Health systems have to prepare for climate-related events."

—*Marc Chalufour*



Fishing is a main source of income for many living near Lake Victoria in Kenya.

DAVE GREEN, COURTESY OF LAWRENCE WERE

THE RISK OF DELAYING PT FOR KNEE OSTEOARTHRITIS

THE NEED TO MANAGE CHRONIC MUSCULOSKELETAL PAIN HAS,

in part, fueled a global opioid crisis. Osteoarthritis, a disease that includes abnormal changes in cartilage, bone, muscles, and other joint tissues, is a leading cause of chronic pain in adults who are middle-aged and older, with knee osteoarthritis accounting for more than half of those with arthritis worldwide, according to the Institute for Health Metrics and Evaluation. And while exercise and education provided by physical therapists

are recommended first-line interventions for knee osteoarthritis, opioids are often prescribed first.

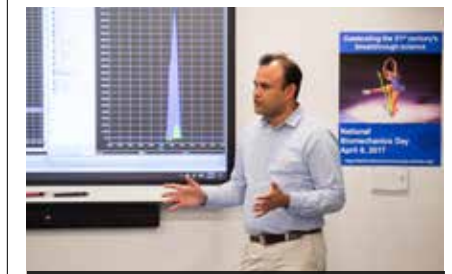
But new BU research shows that the sooner a patient starts physical therapy after being diagnosed with knee osteoarthritis, the less likely they are to become reliant on opioids. The research was published this year in the *British Journal of Sports Medicine* by Deepak Kumar, an assistant professor of physical therapy, and colleagues at the BU Chobanian & Avedisian School of Medicine and BU Physical Therapy Center.

Kumar and colleagues analyzed insurance claims data from approximately 67,000 people spanning 19 years. They found that delaying the start of physical therapy by more than one month after a diagnosis of knee osteoarthritis was related to greater risk of opioid use, including

long-term use. Importantly, findings were the same whether or not the person had a history of opioid use.

"These findings suggest that healthcare providers and patients should strive to initiate physical therapy early to reduce the risk of opioid use," Kumar says. "The longer the delay, the greater the risk."

—*Stephanie Rotondo*



Deepak Kumar says starting knee therapy sooner may prevent opioid reliance.

RESEARCH ADVANCES ON TREATMENT FOR STUTTERING

FRANK GUENTHER IS USING TECHNOLOGY TO LEARN WHY PEOPLE STUTTER

In 2009, Frank Guenther collaborated with a team of researchers on a game-changing device that measures signals from the area of the brain controlling speech and translates those signals to a computer in real time.



They implanted electrodes in the brain of a patient with locked-in syndrome—the patient was paralyzed but could move his eyes. Then, they used the device, called a speech brain-computer interface (BCI), to translate signals from the electrodes into acoustic signals, allowing the patient to create vowel sounds on the computer. The more the patient used the BCI, the more adept he became; eventually, he learned to control the computer synthesizer just by thinking about producing a certain vowel sound.

Today, Guenther, a professor of speech, language, and hearing sciences and of biomedical engineering, is looking into

the potential to use electrode system implants and BCIs to address speech disorders such as stuttering, which his lab has studied in recent years.

"Stuttering is very poorly understood," says Guenther. Over time, he says, researchers have settled on a set of structures in the brain called the basal ganglia as the site of impairment for both Parkinson's disease and stuttering. "We know for sure it's [where the impairment is] for Parkinson's because dopamine going to the basal ganglia is depleted, and that's what causes the motor problems. With stuttering, there's something else going on with the basal ganglia, but something not nearly so obvious."

Using the Technology to Treat Stuttering

Guenther points to a procedure for Parkinson's called deep brain stimulation—similar to a BCI—that gives him hope for using electrode system implants to treat stuttering. "The basal ganglia have two pathways," he says. "One is excitatory for movement and the other inhibits movements, and they have to be in the right balance. Parkinson's disease is when the excitatory system is too weak and the inhibitory system is too strong."

With deep brain stimulation, doctors

place an electrode in a particular part of the basal ganglia of a patient with Parkinson's to impair the inhibitory path and balance it with the excitatory path. "That can restore function for quite a long period of time, depending on how fast one's Parkinson's is evolving," Guenther says. He and his lab have been working with doctors at Massachusetts General Hospital who perform deep brain stimulation surgeries to learn more about the procedure's impact on the basal ganglia and to do tests on a neurocomputational model. In July 2023, Caroline Brinkner joined the speech, language, and hearing sciences faculty as a lecturer, and will be assisting Guenther in recruiting subjects for stuttering research.

"It's not out of the question that in a decade or two, there may be some option for people who have a severe stutter, such as a deep brain stimulator or a drug that affects the excitatory pathways, that takes care of the stutter," Guenther says. "I think our modeling may help figure out how to design something along those lines. The possibilities are exciting."

—*Mara Sassoon*



Read an expanded version of this article at bu.edu/sargent/inside-sargent.

CONOR DOHERTY, VERNON DOUCETTE

SERVICE LEARNING TRIPS OFFER EXPERIENCE, HEALTHCARE SUPPORT

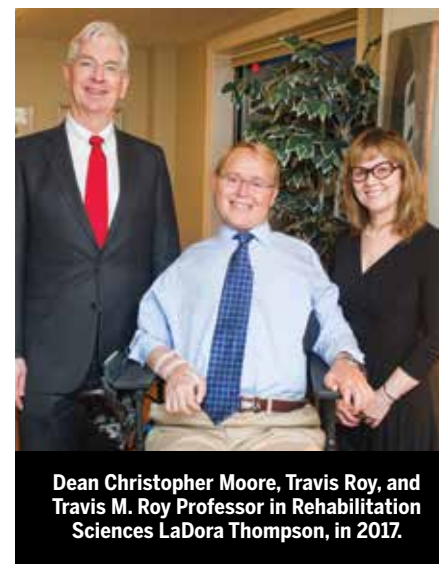
SINCE 2011, SARGENT STUDENTS HAVE TRAVELED MORE THAN 2 MILLION MILES EACH SUMMER TO ENGAGE WITH COMMUNITIES in several developing countries. This summer, Sargent returned to a full slate of International Service Learning experiences in Tanzania (pictured), South Africa, and Guatemala. Working with underserved communities in both urban and rural contexts, undergraduate and graduate students partnered with community health workers in learning about the delivery of basic healthcare services, supplementing their classroom learning. Jacqueline Lauer, a clinical assistant professor of health sciences, led the experiences in South Africa and Tanzania, in collaboration with EDU Africa, and Sargent partnered with socially conscious travel company Operation Groundswell to serve in Guatemala.



NEW SCHOLARSHIP NAMED FOR TRAVIS ROY

THE TRAVIS ROY FOUNDATION AND SARGENT COLLEGE ANNOUNCED IN MAY the creation of an endowed scholarship fund named for the late Travis Roy (COM'00, Hon.'16), whose spinal cord was broken in his first game for the BU men's hockey team in 1995, paralyzing him. The Travis M. Roy Endowed Scholarship Fund, established through a \$1 million gift from the foundation, will provide annual awards to one or more doctoral candidates enrolled in Sargent's occupational therapy or physical therapy programs. The foundation has also provided

an additional \$15,000 to support the further integration of Travis Roy Scholars into the wider scientific and clinical community. "This is a tangible living legacy to Trav's life and impact, pursuing his quest for 'how good can I be' and enabling Sargent's programs and its students to do the same," said Roy's parents, Brenda and Lee. "The Travis Roy Endowed Scholarship Fund highlights Travis' passion for helping others and his life of gratitude in the face of adversity."



Dean Christopher Moore, Travis Roy, and Travis M. Roy Professor in Rehabilitation Sciences LaDora Thompson, in 2017.

JACKIE LAUER, CYDNEY SCOTT

“WE DON’T FULLY UNDERSTAND HOW THE BRAIN WORKS, LET ALONE WHEN SOMETHING GOES WRONG IN THE BRAIN, ESPECIALLY IN CONDITIONS LIKE DEMENTIA. Our goal is to become a national, international, premier center to understand, diagnose, and treat individuals with brain disorders. This is the right center for the right university at the right time.”

—*Swathi Kiran, the James and Cecilia Tse Ying Professor in Neurorehabilitation at Sargent, on the BU Center for Brain Recovery, which she founded and directs. Read more about the center, which opened in 2022, at bu.edu/articles/2022/new-bu-center-for-brain-recovery/.*



AWARDS & HONORS

HEALTH SCIENCES

Courtney Campbell ('23), a nutrition student, was named Outstanding Dietetic Intern of the Year by the Massachusetts Academy of Nutrition & Dietetics.

OCCUPATIONAL THERAPY

Pedro Almeida, a clinical assistant professor, received an intervention research grant from the American Occupational Therapy Foundation.

PHYSICAL THERAPY

Jana Iverson was named the inaugural Christopher A. Moore Professor of Pediatric Rehabilitation.

SPEECH, LANGUAGE, AND HEARING SCIENCES

Kimberly Dahl ('24), a PhD candidate, was awarded a 2023 scholarship from the Council of Academic Programs in Communication Sciences and Disorders.

Elizabeth Murray ('19) and **Erin Meier ('18)**, PhD alumni, received the Early Career Contributions in Research Award from the American Speech-Language-Hearing Association.

NEW FACULTY

Caroline Brinkert, lecturer, speech, language, and hearing sciences

Jack Dennerlein, professor, physical therapy

Jamie Klufits ('15, SPH'15), lecturer, health sciences

Alison Lessard, lecturer, occupational therapy

Jesse Moreira ('18,'21), clinical assistant professor, human physiology

Katherine Stewart, clinical assistant professor, occupational therapy

Monica Watford, clinical assistant professor, occupational therapy

PROMOTIONS

Lou Awad, associate professor, physical therapy

Lisa Brown, clinical associate professor, physical therapy

Shelley M. Brown (SPH'07), clinical associate professor, health sciences

Terry Ellis, professor, physical therapy

Leanne Yinusa-Nyahkoon ('01,'03,'09), clinical associate professor, occupational therapy

The Moore Legacy

Snapshots from the tenure of a transformational dean

By Steve Holt



By now, Chris Moore is probably on a boat with a grandkid or two around him. Moore, who retired this summer after nine academic years as dean to move near family in the Pacific Northwest, is also likely basking in the assurance he's left Sargent well-positioned for continued success. Under his leadership, Sargent increased graduate enrollment, faculty and staff head count, external funding for research, and student scholarships, partnered with dedicated supporters to endow its first three named professorships, and expanded its campus footprint while enhancing existing facilities. Graduate enrollment doubled during his tenure—767 students in 2022—while maintaining Sargent's high national rankings. The school's graduate programs tracked by *U.S. News & World Report* all rank in the top 20 nationally: the occupational therapy program at No. 1, the speech-language pathology program at No. 10, and the physical therapy program at No. 20. During Moore's time at the helm, grant funding from foundations and agencies like the National Institutes of Health (NIH) has more than doubled, and federally funded research expenditures increased to more than \$700,000 annually per tenure-track faculty member. Under Moore's direction, Sargent has become a launchpad and training ground for future leaders and educators in the field through, for example, a prestigious T32 NIH training grant for pre- and postdoctoral fellows. Adding to all that are a cadre of new alumni supporters, student scholarships, and the renovation of many classroom, seminar, laboratory, and research facilities. Moore's fingerprints are everywhere at Sargent, securing the school's position as a leader in education, research, and clinical practice for decades to come.



EXPERIENTIAL AND STATE-OF-THE-ART LEARNING

Moore reimagined several of Sargent's key labs and learning spaces—while increasing the number of clinical placements and experiential learning opportunities. **1)** Moore opens the new **Center for Simulated Clinical Experience**, which provides students an experiential learning space that simulates the capabilities and procedures of an acute care hospital room or a radiology suite, mirroring a real-world clinical setting; **2)** The **Physical Therapy Lab**, renovated in 2014, features equipment for up to 40 students at a time to learn examination and intervention strategies and a state-of-the-art media system for students' self-review—creating an optimal teaching and learning environment.

CUTTING-EDGE RESEARCH

A researcher himself, Moore supported a wave of transformational studies by faculty and their students. He oversaw the increase of diverse faculty and staff, expanding the pipeline of future, field-defining and field-shaping leaders by tripling support for PhD students and postdoctoral research fellows. Key partnerships with Sargent supporters resulted in the creation of three new endowed named professorships. These professorships, which Moore awarded during his tenure, included LaDora Thompson as the Travis M. Roy Professor in Rehabilitation Sciences, Jana Iverson as the Christopher A. Moore Professor of Pediatric Rehabilitation and associate dean for research (see page 18), and **3)** **Swathi Kiran as the James and Cecilia Tse Ying Professor in Neurorehabilitation**.

STRENGTHENING A COMMUNITY

Moore's focus on program excellence drove a 50 percent increase in graduate enrollments over his tenure. His enthusiasm and approachable manner shone through in his interactions with faculty, staff, students, and alumni, and his leadership during the COVID-19 pandemic instilled a sense of stability and security. To ensure students had a financial safety net during this difficult time, Moore launched the Sargent Cares Emergency Fund in 2020, which provided grants to help students recover from unexpected losses of employment, lent technology support, and most importantly, ensured students could continue their education at BU. **4)** Beginning in fall 2023, visitors and members of the Sargent community were welcomed to the college by a **renovated lobby**, complete with plentiful seating, digital displays, and a first-floor academic services center; **5)** **Moore chats with Dolores T. Jordan ('49, Wheelock '60)**, known as "Dutchie," at a luncheon during Alumni Weekend 2022. ■



MELISSA OSTROW; JAKE BELCHER; CYDNEY SCOTT; CHITOSE SUZUKI

ASTRID POODTS; ICON ARCHITECTURE

The Quest to Unlock the Mind's Mysteries

Tyler Perrachione is mapping the brain to understand its inner workings

By Ting Yu



DECIPHERING THE COMPLEXITY OF THE HUMAN BRAIN, WITH ITS BILLIONS OF NEURONS, IS ONE OF SCIENCE'S most tantalizing puzzles. In the last three decades, noninvasive advances in brain imaging have led to significant breakthroughs in how we understand the inner workings of the mind. We know, for instance, that language is primarily processed in the left hemisphere and that a particular occipital sulcus—or groove in the brain—first translates visual inputs. But while researchers have a rough sense of the brain's functional neighborhoods, they still don't have a clear street-level view.

Tyler Perrachione, an associate professor and director of the Communication Neuroscience Research Laboratory, is angling to get a sharper image. "The current atlases we have are very coarse," he says. "Over its 30-year history, brain imaging has helped teach us what the average brain looks like. Human brains are organized basically the same, but the local organization is still pretty different."

Perrachione is pursuing multiple studies to get a finer-scale understanding of neural organization and function. Having a more detailed picture of individual brain structure and tissue properties has promising medical applications. Physicians could target more effective rehabilitation strategies for stroke victims, and neurosurgeons would have clearer margins for avoiding brain tissue that might damage a patient's cognition or speech. "It's like a personalized medicine approach to brain mapping," Perrachione says.

Using new methods developed by his lab, Perrachione is working to create individual maps of the temporal lobe that can shed light on the nuances of typical brains and those of people with developmental communication disorders. Such insights could reveal clues about the origins of dyslexia or autism and illuminate new avenues for research.

"Can we find meaningful organization in the structure of the brain that's consistent across people but unique to each person?" he says. "We may find that the reasons some kids struggle to read or communicate are different from the reasons other kids struggle. Ultimately, it gives us an entry point to ask more precise questions than we've been able to ask before. And maybe we can begin to understand the etiology of these disorders."

REVEALING SCANS

At the heart of Perrachione's research is a bank of 1,200 high-resolution MRI brain scans collected from academic and medical centers across Boston. In 2019, colleagues from BU, Northeastern, MIT, Harvard, and Massachusetts General Hospital contributed brain scans from more than 1,200 anonymous patients and research subjects with and without developmental disorders, ranging in age from 4 to 40. Roughly half of the scans come from individuals with dyslexia and about five percent come from those with autism.

"Everyone was excited about it," Perrachione says of the collection. Unlike donated brain tissue, which can only be

studied once, MRI brain scans are an infinitely reusable resource that can be analyzed over and over again, limited only by the curiosity of the investigator. The scans provide an opportunity to test assumptions that scientists have about which areas of the brain are responsible for certain functions. The reality is that "human behaviors don't always cleanly map onto the brain" in the ways scientists have categorized them, Perrachione concedes. "Sometimes the organization of the brain surprises us."

In a study comparing the fMRI brain scans of subjects with and without dyslexia, Perrachione looked at whether reading disabilities may be the result of differences in neural organization or activity. His lab evaluated the activation of the frontal and temporal lobes during language-related tasks to discern if there was a difference in responsiveness. There wasn't. "Our findings indicate people with dyslexia *aren't* wired differently for language," Perrachione says. Instead, they may have "trouble bringing their language system to bear on a visual task like reading. This helps us narrow down where the problem is and how we should target remediation."

In a separate study on the brain scans of autistic subjects, Perrachione's lab did discover a striking anatomical variation in children with autism. The auditory cortex—the part of the brain that is responsible for processing sound—was markedly larger in kids with autism. Because the original study from which the scans were taken also collected questionnaires from subjects, Perrachione was able to find a compelling correlation: children

with larger auditory cortices in the right hemisphere had more severe autism symptomology, such as challenges with attention, social interaction, and repetitive behaviors.

“Human brains are organized basically the same, but the local organization is still pretty different.”
—Tyler Perrachione

Perrachione has a hunch that the larger auditory cortices may explain why some children with autism seem to get overwhelmed in busy environments. "Imagine you have a bigger pipe bringing sound information into your brain," he says. "You can see how that might make it hard to filter out extra sounds and be distracting. Having more tissue that processes sound could dominate your attention or cause hypersensitivity to auditory stimuli."

Perrachione's dream is to collect long-term datasets of individual brains over decades to better understand neural plasticity. "The challenge in neuroscience is that when we look at a brain scan, we're looking at a snapshot. But everything we are today is a consequence of everything that we've been through," he says. "It would be tremendous if we could get longitudinal datasets about tissue organization and structural connectivity over time. To really understand an individual brain not as a fixed state, but as a transition across development—to have a four-dimensional view. It's not so much about what the brain *is*, but where it's come from and where it's going." ■

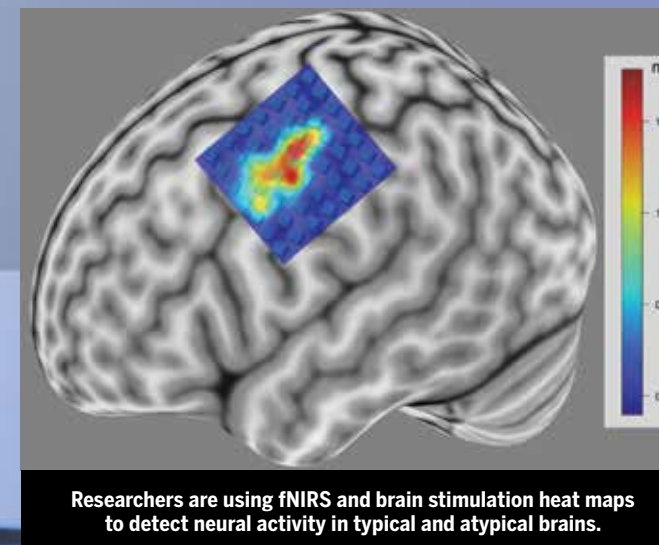


CYDNEY SCOTT '22

Childhoods Transformed

Claudio Ferre uses technology to better understand how children move and to inform future therapies

By Eric Butterman



IT'S A CHALLENGING SCENARIO FOR ANY PARENT OR CAREGIVER: A DOCTOR DELIVERS THE NEWS THAT

their young child will live with a chronic disease, disorder, or delay. But what if caregivers could begin interventions for a child's speech delay, or even a more impactful disorder like cerebral palsy, before a condition is typically diagnosed? In a pair of groundbreaking research projects, Claudio Ferre, an assistant professor of occupational therapy, explores that question.

In one study, Ferre and other BU researchers are working to improve the lives of the nearly one in ten young children in America who live with a noticeable speech delay or disorder. Ferre is using the sophisticated imaging technique called functional near-infrared spectroscopy (or fNIRS) to track the brain activity of infants who are two to six months old to "identify kids who may be at risk for language delay much earlier based on their motor profiles," Ferre says. A child's motor system, or their ability to move their body, is

the first to develop and may be a precursor for the development of other systems.

"There is evidence to show early movement actually sets the stage for language function," says Ferre, who, along with Jennifer Zuk, an assistant professor of speech, language, and hearing sciences, received a grant from the BU Wheelock Institute for Early Childhood Well-Being for their language research. "We're using an imaging technique that builds a foundation of mechanistic research for our work."

The fNIRS technology measures changes in brain areas that are active, using light to measure changes in blood. "Blood absorbs light at different frequencies, depending on whether it's oxygenated or deoxygenated," Ferre says. "Using sensors, which shine light into the brain, and light emitters measure how much light is absorbed, creating a marker of brain activity." By looking at atypical brain activity, movement, and milestones early on in life, they have a chance to find important connections, Ferre says.



CIARA CROCKER, COURTESY OF CLAUDIO FERRE

Researchers will relate their observations back to language function when the infants are around a year old, Ferre adds, and follow that with appropriate interventions—typically physical and occupational therapy. “If we can identify infants who might be at risk for language impairments

“**If we can identify infants who might be at risk for language impairments later in life, we can think of interventions for movement that can be delivered early in development—when the nervous system is very malleable.**”

—Claudio Ferre

later in life, we can think of interventions for movement that can be delivered early in development—when the nervous system is very malleable.”

A FOCUS ON THERAPY

Another of Ferre’s focus areas relates to therapy’s effect on the 10,000 children born each year with cerebral palsy. Cerebral

palsy is typically caused by a brain injury before birth that affects movement, he says. “Since it’s happened so early, the brain has a strong ability to adapt in response to the injury,” Ferre says, adding that with cerebral palsy there can be a large variation from child to child in terms of clinical presentation.

Ferre employs a noninvasive technology that uses magnets to stimulate the brain in order to test which parts control various muscles in older children with cerebral palsy. By delivering magnetic pulses to parts of the brain using a handheld wand, Ferre can map out the control of a child’s arm and hand muscles.

That information, he says, can show how different areas of the brain take over after a brain injury and can be used to determine whether intensive physical therapy was effective. “We can make a map at baseline and have children do intensive upper limb therapy,” he says. “We can ask questions like, did the maps expand? Did the muscles get stronger? Are they easier to activate? We can use these brain areas as additional targets for therapy. If we can identify which brain areas take over after brain injury, we ask are those areas we can potentially stimulate with noninvasive brain stimulation that is therapeutic and pair that with motor training to capitalize on neuroplasticity in the system.”

Ferre says part of the problem with current therapy for cerebral palsy—typically extensive physical, occupational, and speech therapy to help children live with the condition—is the time commitment it requires.

“If you do therapy that is intense and structured, a good portion of children with cerebral palsy will benefit,” he says. “In fact, there is a great deal of literature on the subject, and it shows doing 90 hours of therapy in a period of three weeks makes a difference.” That kind of time commitment isn’t feasible for many families, however, and Ferre says his study will look into ways to enhance the efficacy of therapy by personalizing or matching how therapy is applied to a

child’s unique neurophysiological pattern.

The hope, Ferre says, is that a more targeted approach “can cut down on therapy time, which could help increase therapy access to a broader number of people.”

The evidence is still building, he says, but “it’s exciting to see how well we can understand how brain areas reorganize and, therefore, where we should be stimulating. We hope that we can make therapy more family friendly and accessible.” ■

CLINICAL RESEARCH SPOTLIGHT

KAREN JACOBS AT WORK



Karen Jacobs, a clinical professor and associate dean for digital learning and innovation, studied people working from home at least four days a week for six months. Using their smartphones, participants contributed an estimated 60 million data points pertaining to areas such as productivity,

organizational trust, and movement. “Organizations that fostered an environment of trust, allowing employees to work effectively without micromanagement, providing them with professional development opportunities, flexible hours, and locations while working remotely, tended to correlate positively with the overall happiness and life satisfaction of their workers, with higher mental and physical well-being, a stronger sense of purpose, and close social relationships,” Jacobs says.

A VISION OF HOPE



OT Clinical Associate Professor Jennifer Kaldenberg studied whether older adults with vision impairment might benefit from devices such as iPads to complete everyday tasks, using standard accessibility functions as well as certain apps. One participant had a goal of being able to put on makeup, and was

aided by an app with magnification, Kaldenberg says. “She actually put on makeup for the first time in five years. Many people think older people can’t use technology, but they can and do for multiple hours a day for a variety of activities,” Kaldenberg adds. “This can change quality of life.”

VERNON DOUCETTE; CHITOSE SUZUKI

Healthy Relationships for Autistic Adults

EMILY ROTHMAN'S ONLINE PROGRAM SEEKS TO STRENGTHEN BOTH ROMANTIC AND PLATONIC CONNECTIONS

BY ALENE BOURANOVA

Relationships are tricky. It doesn’t matter if they’re romantic or platonic: both have their unspoken rules and expectations, and figuring out what those are—and how they vary from person to person—can feel like a guessing game.

It’s even harder if you’re neurodivergent. For individuals on the autism spectrum, dating and making friends can require a little extra work to navigate hidden nuances.

Enter HEARTS, or Healthy Relationships on the Autism Spectrum, a virtual course for autistic adults developed by professor and chair of occupational therapy Emily Rothman.

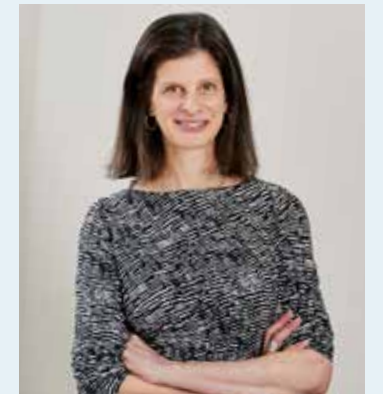
Back in 2020, Rothman, a former domestic and sexual abuse preventionist, received funding from the National Institutes of Health to make a career pivot to autism research

after learning about a family member’s autism diagnosis. Her research, combined with her background in violence prevention, soon led her to the topic of healthy relationship promotion for autistic adults.

“Adult autism intervention is a relatively new field, and there was a big gap [regarding] healthy relationships and sexual violence prevention,” she says, adding, “All people are interested in learning about how to have healthy relationships.” With the course, “we just break the information down in a way

that speaks to someone’s experience as an autistic person, and deliver it in a manner that feels accessible to their way of acquiring new information.”

Rothman developed HEARTS with the help of former BU School of Public Health senior postdoctoral associate Laura Graham Holmes, who remains involved in the project. Asperger/Autism Network (AANE), a Watertown, Mass.-based autism nonprofit, is a partner. Rothman and Graham Holmes also meet quarterly with their five-member “autistic advisory board.” (“We don’t do anything without consulting the board,” Rothman says.)



All people are interested in healthy relationships, Rothman says.

Pilot classes began in 2020. Each HEARTS course is six weeks long and consists of weekly 90-minute online classes. They’re open to any autistic person 18 and over.

Each course has around 15 students, Rothman says, with participants dialing in from the US, Canada, and as far away as Israel. The classes cover topics like active listening, recognizing abusive or controlling relationships, setting boundaries, reconnecting with old friends, and dealing with rejection and trying again. Optional weekly homework includes activities such as “diagnosing” healthy or toxic relationships among characters in movies and TV shows.

Each course is taught by an autistic instructor. (They’re joined by a nonautistic coteacher trained in domestic and sexual violence prevention.) Rothman and Graham Holmes quickly identified the importance of employing autistic people to lead the courses. In preliminary research interviews with autistic young adults, “people kept saying, ‘we’re tired of nonautistic people telling us about how bad our social skills are’ or that ‘you’re supposed to make eye contact,’” Rothman says. “They’d ask, ‘Autistic people are whole and complete—why aren’t they teaching classes?’”

Earlier this year, Rothman and her colead Susan White received a second grant from the NIH to conduct HEARTS courses as a three-year randomized control trial. The trial period began mid-April and will conclude in 2026. The results will illustrate the impact and feasibility of the HEARTS curriculum.

Until then, she has student feedback to rely on. Recently, she received an email from a former HEARTS participant. The student wrote that thanks to the course, she felt brave enough to try dating. She ultimately met someone and fell in love—and they were moving in together. “This was a really stable and excellent partnership for her, and she wrote that she was so grateful and thankful for the class,” Rothman says. “I was like, ‘No, no, that was all you—you made this happen, not the class!’ But it was a really nice message to get.”

She continues, “I’ve been a researcher for 20-plus years, and this has been the most rewarding experience [of my career]. It’s an amazing, positive feeling.” ■

Big Science *for* Little Ones

**SARGENT WELCOMES
INTERNATIONALLY RENOWNED
CHILD DEVELOPMENT EXPERT
JANA IVERSON
BY MARA SASSOON**

Babies may begin pointing at objects at about nine months, and while this might seem like a cute but routine stage in their growth, to Jana Iverson, it's much more important than that. Iverson, associate dean for research and Christopher A. Moore Professor of Pediatric Rehabilitation, studies the connections between early motor development and emerging communication and language skills in infants and toddlers.

In one study, she found that the earlier children begin to make gesture-word combinations—pointing at something and saying a word, for example—the earlier they will start to say their first two-word utterances. “When infants are at the stage where they can say a few words, but the words aren’t easily understood by the adults around them, they use gestures to help clarify their message, and sometimes they even use gestures to add information to what they say with their words,” says Iverson, who also leads Sargent’s Infant Communication Lab. “It turns out that when they convey one piece of information in gesture and one piece in language, that’s a really important phenomenon where they’re exercising their ability to combine two ideas into a single communication.” She adds that this kind of skill is an important entryway into the development of grammar in a child’s second year.

In Iverson, Sargent has brought on an internationally respected scientist who studies the ways kids grow and develop. Her published work includes groundbreaking research on motor and language skill development in infants who have an older sibling with autism, and she is leading a new study on improving motor development in babies with Down syndrome. Her expertise will amplify Sargent’s interdisciplinary pediatric research and its dedication to improving rehabilitation outcomes.

ESTABLISHING AN AUDITORY-SPEECH CONNECTION

Iverson has long been fascinated by how we communicate. Growing up in a military family, she lived in Italy for two years. Babysitting neighbor kids there, she says she “was really struck by how these little children were masters of this language that was so hard for me to figure out.”

As an undergraduate psychology student at Bryn Mawr College, she discovered a professor whose research focused on how children learn language, and knew that was the field she would work in. Her graduate training—she received her MA and PhD from the University of Chicago—centered on how children communicate before they learn language, and how older children and adults use hand gestures to support their communication. She wanted to learn more about the motor system in order to understand how the coordination between speech production and hand movements develops in infancy. During a postdoctoral fellowship at Indiana University, she studied with the late Esther Thelen, an expert on infant motor

"...IF LEARNING LANGUAGE IS GOING TO BE CHALLENGING FOR YOU, AND YOU'RE ALREADY CONSTRAINED IN YOUR ABILITY TO INTERACT WITH THE ENVIRONMENT, IT'S SETTING YOU UP FOR ADDITIONAL CHALLENGES ALONG THE WAY. SO, EARLY MOTOR DELAYS ARE A BIG THING TO REALLY ATTEND TO AND TAKE SERIOUSLY."

—JANA IVERSON

development. "I was really fascinated by the fact that so many things happen in a child's first year. Babies roll over, they sit, they crawl, they stand, and then they walk. While infants are learning to do those things, they're also laying the groundwork for language," says Iverson. "So, I started to think about the question of how does motor development create opportunities for infants to access situations and learning opportunities that are useful for building skills for language?"

Iverson has focused much of her research on how infants who have language delays use gestures. In one study, she found that infants with Down syndrome use gestures to compensate for difficulties they have producing words. At the University of Pittsburgh, where she taught before joining Sargent's faculty, she researched infant siblings of children with autism in order to find early indicators that they might also be diagnosed with autism later. Iverson's research on vocal-motor development in children and families affected by autism goes back to 2003. "There was this increasing awareness of the fact that many parents of autistic children would go to the pediatrician when their children were very young and express concern about their child's development," she says. "But the pediatrician would say, 'Well, we'll have to wait and see.'" Parents, she says, would then be left with few resources because they weren't able to get a diagnosis until their child was three or older. That was in part because the diagnostic criteria were largely based on skills that emerged in a child's second and third years of life. "The idea was that if we could identify these [autistic] infants really early, we might be able to develop some sort of intervention or do something that might eliminate this long gap between initial identification and services," Iverson says.

Siblings of autistic children are more likely than other children to develop autism. "One of the things that we found was that in that subgroup of infants who eventually receive an autism diagnosis, you start to see differences in gesture production as early as 14 months," she says. "In particular, one of the things that's very different [in their motor and language development] is how they combine gestures and speech into these little combinations—they do it much less frequently, and their production of those combinations doesn't really increase over time. It stays relatively flat."

Iverson says the studies she has done on children with autism emphasize the significance of early motor delays. "That was shoved aside for a long time. There was this wait-and-see approach," she says. "But in fact, for these infants who have an elevated likelihood for a neurodevelopmental disorder, an early motor delay is really very problematic—if learning language is going to be challenging for you, and you're already constrained in your ability to interact with the environment, it's setting you up for additional challenges along the way. So, early motor delays are a big thing to attend to and take seriously."

MOVEMENT CREATES OPPORTUNITIES

In April 2023, Iverson received a grant from the National Institutes of Health to study motor development in babies with Down syndrome. In preparation for a clinical trial, Iverson will provide bodyweight-supported harnesses to families with infants with Down syndrome. Depending on the child's level of postural control, the harness can give them more or less support. She hopes that by providing these infants with the harnesses, they'll have more opportunities to move around and explore their surroundings. In turn, this could improve not only their motor skills but also their opportunities for interacting with their caregivers.

The idea, Iverson says, is that parents will set up in their homes soft seats suspended from a lightweight frame, allowing the infants to move freely around a space like a living room. Iverson and her fellow investigators will observe the infants to see how the harnesses change their navigation around their daily environment, their everyday activities, and their interactions with caregivers. Iverson will note data points such as how far an infant travels while in the harness, how often they vocalize and use gestures, and how they engage with objects. "This grant will help us do these detailed longitudinal observations in order to come up with the best outcome variables—how are we going to measure change? What are the best behaviors to look at? Then we can move into a clinical trial," she says.

"Babies with Down syndrome have really significant motor delays early on, and they're very stationary for a long time—many don't walk until they're two or three years old. The hope is that getting infants in the harness should open up opportunities to get [more] items, and to move around and approach a caregiver with a toy, and then for the caregiver to talk about it," Iverson says. "It should enrich the environment in ways that we think are going to be beneficial for development very broadly." ■

Hope for More Holistic Autism Support

SIMONE GILL IS EXPLORING THE CONNECTION BETWEEN EARLY CHILDHOOD AND MOTOR DEVELOPMENT IN CHILDREN WITH AUTISM

BY STEVE HOLT

Caregivers of young autistic children who are non-verbal often face an excruciating wait to find out if or when the little ones will learn to speak. Some autistic children start with significant delays but develop language during early school years; others remain only minimally verbal much later. Simone Gill, an associate professor of occupational therapy, is trying to understand why this is so. She believes a child's motor skills could help predict later language development. In an interdisciplinary research project, Gill and Helen Tager-Flusberg, a professor of psychological and brain sciences at the College of Arts & Sciences and principal investigator of the five-year National Institutes of Health (NIH)-funded study, are working with speech therapists from Massachusetts General Hospital to explore whether oral motor function may be related to gross motor function, or the way a child moves their whole body.

"Researchers are finding that there are these differences in movement that might be keeping [children] from being able to engage in social interaction," says Gill. "If that is the case, then that would suggest we could create interventions that perhaps could improve both [speech and motor skills]. And if they're not related, then perhaps we need targeted interventions to work on one area versus another."

Researchers launched their data collection remotely in 2020 during the COVID-19 pandemic, having children aged three and a half to seven, with and without autism, complete a battery of physical tests over Zoom conference calls. Using a technology developed at New York University, researchers analyzed the video frame by frame to count how many steps a child took and calculated their velocity, balance, and other motor skills. Since mid-2022, families have been participating in the study in person at BU's Center for Autism Research Excellence. Autistic children are asked to walk on a special mat embedded with sensors, which calculates their speed and how far apart their steps are compared to children without autism. Kids balance on one foot (with researchers observing if and when they reach out to steady themselves), and then researchers have them complete a series of movement tests that include putting items in a box, throwing a ball against a wall, and jumping.

CLARA CROCKER



Simone Gill is part of a big, bicoastal research study exploring ways to recognize and treat autism in young children.

Gill says her team collected data from 105 children remotely during the pandemic and aim to assess an additional 60 children in person—30 who are typically developing and 30 with autism—before the NIH grant ends in June 2024. The preliminary results suggest autistic kids' gross motor skills and the ability to speak may be more closely related than previously thought, she says.

Many of the minimally verbal autistic children she's observed display other movement challenges or inconsistencies, be they ever so slight. Developmental psychologists at Boston Children's Hospital are conducting brain imaging to better understand any differences in the groups of autistic children being observed. Finally, researchers are analyzing the effectiveness of two play-based interventions for movement and language deficits, administered at the Kasari Lab at the University of California-Los Angeles. Gill says she's optimistic that the findings will open a new window into the inner workings of neurodivergent children and give their families and support teams peace of mind.

"Hope remains that we can create interventions that will be more impactful for [autistic] children and their families," Gill says. "The hope is maybe they won't have to go to five different specialists to receive help. Maybe they could just go to a few because we are able to put our resources together and find out how to help them in the most efficient way." ■

“Hope remains that we can create interventions that will be more impactful for [autistic] children and their families.”

—Simone Gill



DISCOVERING THE HIDDEN CAUSE OF VOICE INJURY

CARA STEPP HAS ESTABLISHED A CONNECTION BETWEEN HEARING IMPAIRMENT AND VOCAL HYPERFUNCTION—AND PERHAPS A NEW DIAGNOSTIC CATEGORY

BY MARC CHALUFOUR

Nearly one-third of people will develop a voice disorder during their lifetime. These can range from fatigue or pain while speaking to losing their voice completely. The most common cause, making up 3 to 9 percent of cases, is vocal hyperfunction, a broad category that’s diagnosed only after more specific issues, such as cancer, are ruled out.

Some people develop nodules or polyps on their vocal folds, the bands of tissue in the larynx that vibrate to create voice. Others experience excessive tension, even without those growths, in the larynx, which alters their voice. Yet little is known about vocal hyperfunction (VH) and its causes or, in fact, whether it actually covers multiple conditions.

Without an obvious cause, these symptoms are sometimes attributed to psychology or the patient using their voice incorrectly. But Cara Stepp, a professor of speech, language, and hearing sciences and director of the STEPP Lab for Sensorimotor Rehabilitation Engineering, may have found a clue to another explanation. In a recent study, she established a connection between hearing problems and VH—“a paradigm shift for understanding development and treatment,” she and her colleagues wrote. Their findings are significant because there’s

no auditory component to traditional voice therapy, and many people with VH relapse following therapy. Stepp believes the reason is an undiagnosed underlying issue, like a hearing impairment, hasn’t been addressed.

The current definition of VH is so broad, Stepp says, “there might be a few different disorders lurking in there.” With a new five-year grant, she’s focused on determining whether one or more of those unidentified disorders could be related to hearing impairment—and if so, whether that predicts which patients won’t benefit long-term from speech therapy.

ESTABLISHING AN AUDITORY-SPEECH CONNECTION

Stepp didn’t follow the traditional path into speech-language pathology. She studied engineering as an undergraduate and graduate student, focusing her research on hearing. As a doctoral student in biomedical engineering, she looked at how VH is assessed in clinics. Stepp noticed that the voices of the people she worked with—strained, high-effort, and “breathy”—matched descriptions of the voices of Deaf speakers.

“I got really interested in the way auditory feedback is used for speech,” she says. “For many years, it kept crossing my mind that maybe a subset of this big group of people [with VH] could

“THIS PROJECT STARTED WITH THEORETICAL SCIENCE. SEEING IT GET CLOSE TO BEING CLINICALLY ACTIONABLE MAKES ME EXCITED.”

—CARA STEPP

have an auditory impairment.” After all, proper control of the larynx is related to a speaker’s ability to detect auditory cues from their own voice.

In 2017, Stepp finally got the chance to investigate her theory. Working with the Massachusetts General Hospital Voice Center, Stepp and doctoral student Defne Abur (’22) recruited 124 people, half with vocal hyperfunction and half without. In one experiment, participants listened to recordings of their own voices. “What we found was that individuals with these voice disorders were less aware of auditory changes,” says Stepp.

In another exercise, participants were asked to repeat a sound several times. Researchers altered the pitch of their voices in real time and looped the audio through the participants’ headphones as they continued to speak. Members of the control group, those without VH, tended to adjust their voices in reaction. If they heard a higher-pitched voice than they expected, they compensated by speaking in a lower pitch.

Subjects with VH didn’t react as consistently, and some actually overcompensated—adjusting their voices several times more than that of the altered recording. Others “followed” their altered voice, speaking with a much higher pitch than the recording. “What was really interesting was that there was a relationship between the people who had these atypical integration behaviors and the people who had the worst auditory sensitivity to begin with,” Stepp says.

Those findings suggest a cause of VH that nobody had been looking for—impaired hearing translating into poor control of the larynx. “These are people who have been told, ‘You don’t have a neurological issue—you either have a structural issue, or what you have is related to behavior,’” Stepp says. “It makes it sound like it’s in your head.”

Stepp is now looking at whether hearing impairments are predictive of relapses following therapy. “We’re showing that there is a physiological reason” for some cases of VH, she says. And instead of people being left with the sense of having done something wrong to damage their voice, a more specific diagnosis and a more appropriate treatment plan could give them long-term relief.

FROM THEORY TO DISCOVERY

Allison Aaron, a speech-language pathologist who specializes in voice and a doctoral student in Stepp’s lab, is leading the data collection efforts on the new study. “There are a lot of unanswered questions about why someone might develop vocal hyperfunction,” says Aaron (’26). “Something that drove me into this field is the stigma surrounding voice injury.” It’s a stigma she has experienced.

During her senior year of high school, Aaron was playing a lead role in her school’s musical adaptation of *Dirty Rotten*

Scoundrels and was singing a lot. Singing became harder and more uncomfortable, and eventually she was diagnosed with VH. For Aaron, the symptoms were manageable, and she still sings and performs today. But she wasn’t alone: In college, where she majored in vocal performance, Aaron met many other singers dealing with VH. In her work as a speech-language pathologist, she has treated many others with the condition. Some blame themselves for their injuries. “There are so many factors that might be driving vocal injury, and it’s not always about somebody’s technique,” she says. “It’s not that they’re a bad singer.”

In Stepp’s lab, Aaron uses the same tools as a music producer: headphones, microphones, and an effects processor to manipulate voices. Over the course of a session, she guides each study participant through a series of exercises aimed at better understanding the connection between hearing and speech. To test auditory perception, participants are asked to listen to sounds and determine when they’re higher or lower in pitch. Then, similar to Stepp’s last study, participants speak while listening to their voice through headphones. “By manipulating what they’re hearing, we can see how that changes the way they control their own voice,” Aaron says.

Data is gathered from each participant before and after speech therapy. Six months later, they’re surveyed on their voice-related quality of life to see if therapy had a lasting effect. Each session with a participant takes two to three hours, and requires sophisticated equipment—it’s not a process voice clinics could easily or affordably replicate. But Stepp and Aaron hope to develop a version of their protocol that clinicians could use, and even an online test for auditory acuity. If the measures they’re taking of study participants could become part of a typical voice clinic workup, Stepp says, “that could move this from a diagnosis of exclusion to something more specific.” Ultimately, the research could lead to a new diagnostic category and new therapies targeting auditory impairments.

“This project started with theoretical science. Seeing it get close to being clinically actionable makes me excited,” Stepp says. “I’m an engineer—we’re always excited when we think we can make things better.” ■



Research from Cara Stepp helps patients with voice disorders.

MICHAEL D. SPENCER

CYDNEY SCOTT

SECRETS OF THE MICROBIOME

THE GUT IS FILLED WITH TRILLIONS OF MICROBES. BU NUTRITION SCIENTIST MAURA E. WALKER STUDIES THEM FOR CLUES THAT COULD HELP PREVENT AND TREAT DIABETES AND HEART DISEASE

BY ANDREW THURSTON

You're more microbe than human, at least by the numbers. The human body has about 37 trillion cells, but it's home to many more microbes—the gut alone has 100 trillion of them. Swimming and squirming inside your tummy are more than 1,000 species of bacteria, as well as a host of fungi and viruses. Together, they make up your gut microbiome, a unique-to-you community of tiny organisms that helps you draw energy from food and keeps your immune system running.

But sometimes our little companions can work against us, with rogue microbiota playing a role in obesity, depression, cancer, diabetes, and other diseases. One potential factor in determining whether they act as friend or foe: our diet.

While most of us know that scarfing down fried chicken

and ice cream can put our health on the line, nutrition scientist Maura E. Walker says researchers aren't quite sure what's actually happening at the body's minutest levels when we eat different foods. Science has shown a connection between diets dripping with saturated fats and poor heart health, but what are all those wings and sundaes actually doing to the molecules in a cell, to individual proteins, and to gut microbiota?

Not knowing puts science at a disadvantage when it comes to fighting back against cardiometabolic disorders, like diabetes and heart disease, says Walker. Figure out the exact biological changes a diet causes—and why they affect everyone differently—and you can determine who might be at greatest risk, and even come up with earlier detection and prevention tools.

“WE’RE LEARNING MORE AND MORE ABOUT HOW INDIVIDUALS CAN RESPOND DIFFERENTLY TO DIET—IF I EAT SOMETHING, I MAY HAVE A DIFFERENT MICROBIAL RESPONSE OVER TIME THAN YOU. CAN WE HARNESS THE MICROBIOME AND INTERACTIONS WITH DIET TO EXPLAIN THAT?”

—MAURA WALKER

“We’re learning more and more about how individuals can respond differently to diet—if I eat something, I may have a different microbial response over time than you,” says Walker, an assistant professor of nutrition, whose research combines lab-based biochemical work with epidemiological investigations and data science to detail the journey from dinner to disease. “Can we harness the microbiome and interactions with diet to explain that?” She says her goal is to decipher the “really rich biological data” that will allow her “to get at what’s going on in the body between diet and disease, the mechanisms.”

In recent studies, Walker has scrutinized ultraprocessed foods, chemical signatures of healthy dietary patterns, and protein biomarkers of clogged arteries. Her work could help speed the next stage of precision nutrition, allowing clinicians to tailor diets to individual patients and use biomarker tests that spot disease risk decades before any symptoms appear.

“I use both population data and biological data—information about our genes, our microbiome—to help better understand how diet can impact our health throughout adulthood, into older adulthood, and impact healthy aging,” she says.

In a study published in the *American Journal of Clinical Nutrition*, for example, Walker and an international team of researchers looked at how different carb-loaded diets affected gut microbiota and microbial-derived metabolites, which are molecules generated by digestion. They found a diet rich in whole grains and other unrefined carbohydrates had a positive effect on the gut microbiome, boosting numbers of *Roseburia*, a handy little organism that can help prevent inflammation. By contrast, when participants ate a diet with refined grains (like white rice, white bread, and white pasta), their levels of *Roseburia* and the microbe *Anaerostipes*—which helps break down dietary fiber—were lower. The whole grain diet—and here things get a little messy, literally—was also associated with lower concentrations of secondary bile acid in stool samples. Secondary bile acids have been tied to colon cancer.

Although previous studies have shown the health benefits of a whole grain diet, Walker’s detailed, microscopic approach helps illuminate the why and how. She’s analyzing entire diets rather than individual foods and reaching across years rather than days or weeks. As an investigator on the Framingham Heart Study, a BU-led

cohort project focused on cardiovascular disease, she’s been able to look back at the diets of thousands of people over three decades.

“I can look at how diets are changing over time, how they associate with disease,” says Walker, who’s also a BU Chobanian & Avedisian School of Medicine assistant professor of health sciences. “An ultimate goal is to identify biological and other factors that interact with diet that we can detect earlier in the disease course and look at prevention even earlier. At the moment, we look at risk factors—blood pressure, blood lipids—that might not pop up until middle, or even older, adulthood.”

EXPANDING THE ROLE OF DIETITIANS

With trillions of microbes, thousands of people, and decades of diets to look at, there’s a lot of data to deal with. Although she was trained in biology labs, Walker has had to cross disciplines to add data science and epidemiology know-how to her skill set. That’s increasingly reflected in her teaching, too. The rise of precision nutrition—corralling the data generated by scientists like Walker into diets and advice tailored to individuals and their singular microbiomes—has, she says, “created a whole new job field and sector for dietitians.”

“When I’m looking at proteins or metabolites, it’s not like there’s 10; I’m looking at hundreds, maybe over a thousand,” she says. “Data science is something we really need to emphasize to push the field forward and focus on training our nutrition students in.”

The expansion of the field is reflected in the expertise of other recent Sargent nutrition program hires (Walker joined the college’s faculty in 2020), like research professor Nicola McKeown, an expert on genetics and diet, and research associate professor Megan McCrory, who studies energy regulation and nutrition.

For now, Walker’s focus is adding to the available data—about what Americans eat, their genes, their biological systems. Eventually, that could all plug into artificial intelligence programs that would calculate an individual’s chances of getting sick—and suggest a diet that would shift them onto a healthier path.

“If we can collect all this data about you,” says Walker, “can we use advanced data science to tell us exactly what you should be eating to achieve a certain goal, whether that’s getting off a medication or losing weight?” ■

JACKIE RICCIARDI '23

SUPPORT FOR YOUNG ADULTS IN CRISIS

A MOTHER'S LOSS FUELS HER SUPPORT OF
PSYCHIATRIC REHABILITATION FOR COLLEGE
STUDENTS

BY STEVE HOLT



“AS A PARENT, YOU FEEL LIKE IT’S YOUR RESPONSIBILITY BECAUSE THEY’RE YOUR CHILD, AND YOU’VE GOT TO KEEP THEM ALIVE. I THINK I WAS READY TO ABSORB THE BLAME. IT WAS KIND OF A NATURAL REACTION OF A PARENT, WHEN YOU LOSE YOUR CHILD, TO FEEL YOU FAILED. AND THAT’S NOT FAIR.”

—SUSAN KOPTA

Alexis Geneva Knox was “exceptional, from the minute she was born,” her mom says. Alexis was a talented oboist. A budding humanitarian. A teenager whose adventurous spirit led her to an internship in the Oklahoma state capitol and an exchange program in Belgium while she was in high school, and whose compassion compelled her to befriend nursing home residents and English language learners closer to home. A brilliant student, Alexis received early admission to Barnard College in New York City, where she kept her grades high while racking up a jaw-dropping résumé of extracurricular experiences—including internships with then-US Sen. Hillary Clinton (D-NY) and feminist icon Gloria Steinem’s Ms. Foundation for Women. There seemed to be no limit to how bright Knox’s light would shine.

In an instant, however, that light was put out. In the spring of 2006, just weeks away from graduation, Alexis was in a head-on collision with a semi-trailer truck on a North Carolina back road, which killed her immediately. Susan Knox Kopta, struggling to come to terms with her daughter’s death, immediately thought of Alexis’ diagnosis with bipolar disorder months earlier. Alexis never fully accepted it—perhaps a result of growing up with a father who lived with unmanaged bipolar disorder. Kopta remembered the multiple emergency hospitalizations, the barrage of prescriptions, including an antipsychotic, and the day Alexis told her she’d quit her meds, cold turkey. “Mom, I’m not psychotic, and I’m not taking these,” she told Kopta, before spiraling into suicidal depression. Kopta thought about one of her last conversations with Alexis, on the way to her third inpatient stay: “She said, ‘I’m done, mom.’ We talked about suicide, and I said, ‘That’s not an option.’ Her words stuck in my head.”

Despite assurances from local police that Alexis’ death was a tragic accident and not intentional, Kopta—who’d built a career as a successful research attorney in the Oklahoma appellate court system—was overwhelmed by self-blame and grief. She left her job, moved, remarried, and for more than a decade believed Alexis, laden under the weight of her mental illness, had purposely driven into that semi.

“As a parent, you feel like it’s your responsibility because they’re your child, and you’ve got to keep them alive,” Kopta says. “I think I was ready to absorb the blame. It was kind of a

natural reaction of a parent, when you lose your child, to feel you failed. And that’s not fair.”

Two actions helped pull Kopta out of her despair, she says. The first was reading *The Book of Joy*, by Desmond Tutu and the Dalai Lama, who admonish readers who are ruminating on something negative to detach from it and look at it from afar. The second action, a direct result of the first, was that Kopta began to write. For two years, she detached from the events of 2006 and soberly wrote down everything she remembered about Alexis, from her birth to her untimely death. Through this process, Kopta started to shift her focus, from blaming herself to instead supporting families of young people with bipolar disorder and becoming an advocate for the services and systems that evaded her own daughter during a time of crucial need. What Alexis needed, she realized, was psychiatric rehabilitation, “where you’re told how to take care of your new condition, what it is, what to expect, and how to avoid triggers.” Kopta built a resource website for families, bipolar-links.com, with plans to attend college health fairs—the book she eventually published, *Ballasted Wings: Why That Day?* (Lulu Publishing Services, 2019), in hand—with the hope that she could help both universities and families recognize and respond to mental health crises in students. In 2021, Kopta gave Sargent’s Center for Psychiatric Rehabilitation (CPR) a substantial financial gift to launch Flourishing Families, a six-week support group for the loved ones of young adults living with a mental health challenge. She became a supporter of CPR’s NITEO program—an intensive, semester-long cohort helping college students living with a mental health condition (which affects one in three first-year students, according to *U.S. News & World Report*) “to develop wellness tools, academic skills, resilience, and work-readiness.” Kopta believes Alexis would have benefited from such a program, had she lived long enough to find it.

“I heard a really nice quote the other day: ‘Don’t just leave the world a better place, leave the world how you wish you would have found it,’” Kopta says. “If I get to help the world to be a place where resources are provided as standard of care for students immediately after diagnosis—and through NITEO they’re back in college and back on track, back on their feet—if I can even play a little part in helping the momentum of that, that’s what I want to do.” ■



AN A+ CITIZEN

IN HER PHILANTHROPY AND OCCUPATIONAL THERAPY, SHARON RYAN ('70) PUTS PEOPLE FIRST

BY STEVE HOLT

Sharon Ryan loves people. In elementary school, it sometimes got her into trouble. Next to the As and Bs Ryan brought home on her report cards were notes from her teachers that she talks too much, reflecting a girl who approached her relationships with fellow students as seriously as she did her studies. Ryan's teachers attempted to correct her behavior by having her write sentences, like "I will not talk," on double-lined notebook paper. "I was always writing, because I was always talking," Ryan recalls.

At home, Ryan ('70) says she got a pass on her classroom chattiness, however, because she also had a reputation for being kind and welcoming to all. "My mother always said that while grades were important, what mattered most to her was your citizenship," Ryan says. "I always had good citizenship grades, so she was pleased."

Anyone who has received physical or occupational therapy at the Ryan Center for Sports Medicine & Rehabilitation, sought academic support at the Yawkey Center for Student Services, or participated in cross-cultural dialogue at the Howard Thurman Center for Common Ground—Ryan and her husband Robert, retired CFO and senior vice president of Medtronic, were major financial supporters on all three—has experienced Ryan's good citizenship, and kindness, today. "It's always been important that students of color see people who look like them and know that they're not alone in their journey," she says of the family's giving, which spans a variety of causes and institutions, including BU. "We're lucky that Bob has had the kinds of jobs that allow us to do that, to be philanthropic."

As a child growing up in Pittsburgh, Pa., Ryan remembers that education was paramount. Her great-grandmother had attended a teacher's college in Pennsylvania. Her father, a pharmacist, trained Black pharmacy students from Howard University, Duquesne University, and the University of Pittsburgh—who could not work in many white-owned pharmacies because of their race—in his stores. Besides working in her dad's pharmacy, in 10th grade Ryan took a summer job in the occupational therapy department at Pittsburgh's Western Psychiatric Hospital. She enjoyed helping people and hearing their stories, and the fire was lit.

"I decided to apply to BU as my first choice because it did have the number one [OT] program," Ryan says. (Spoiler: it still has the top spot.) As a student, her favorite Sargent classes were in psychology, child development, and those that taught "the mental challenges that a physical disability presents." Ryan's three internships gave her the opportunity to work with radically different populations of Americans—low-income children at a city hospital in New York City, war veterans with mental health challenges at a Veterans Affairs Hospital in Pittsburgh, and those being physically rehabilitated in San Francisco—and set the table for a successful 10-year career in occupational therapy.

Ryan's first OT job after graduation was in the psychiatric department at the Veterans Affairs Hospital in Pittsburgh where she'd done her internship. Then she moved to New

"IT'S ALWAYS BEEN IMPORTANT THAT STUDENTS OF COLOR SEE PEOPLE WHO LOOK LIKE THEM AND KNOW THAT THEY'RE NOT ALONE IN THEIR JOURNEY."

—SHARON RYAN

York City with her new husband, Robert. Ryan poured herself into her adult OT work at the city hospital where she'd been a pediatric intern. Her rehab patients included adults who had survived spinal cord injuries, amputations, and strokes. She valued both the physical component of OT, as well as the psychological and relational. "I liked sitting with the patients, talking to them as you were following the treatment plan, getting to know them," she says.

Her first professional bump in the road came in 1983, when Robert accepted a position with a large, independent oil and gas company in Houston—three months after she'd become chief of occupational therapy in a large nursing home in New York. In Houston, she took a break from OT work to raise the couple's two children, Eric Ryan and Lesley Miller (CGS'94, Wheelock'96), and volunteer in their community and schools. Ryan says she experienced "a lot of racism" in Houston, mainly showing up for community events and having people question whether she (and sometimes her husband) was in the right place.

In 1993, Robert became senior vice president and CFO for Medtronic, and the family moved to Minneapolis, which is where the Ryans have been for the last three decades. The closest Ryan came to going back into OT was attempting to rehab Robert after he broke his collarbone. "I did his treatment one day, and he decided I was too tough," she recalls with a laugh. "I said, 'You need an OT or PT not related to you. Find someone else.'"

The Ryans have used their passion for philanthropy to support their shared belief in the power of education to change lives. Sharon Ryan has been a member of the Sargent Dean's Advisory Board and is serving her second term on BU's Board of Trustees. She credits Sargent for giving her the skills to excel in her occupational therapy career, and, more broadly, for equipping her to be the kind of citizen that would make her mother proud.

"You can go to BU, and you can train in a specific area," Ryan says. "But BU offers many different ways that you can use your education away from BU. I'm a perfect example. I'm using my education in a completely different way. I learned the qualities of leadership, how to plan, and how to organize. I'm not sure when you're in college [that you] see the other paths that your life can take." ■

Faculty in Print

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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Remembering Carolyn Cohen

BY CHRISTOPHER A. MOORE

Carolyn Cohen ('65), a prolific community volunteer, retired educator, and beloved member of the Sargent community, passed away on March 18, 2023. She was 79. Graduating from Sargent with a degree in physical education, Carolyn was a health and physical education teacher, coach, athletic director, and sports official at Boston Public Schools. She used her expertise to enrich many organizations, including the Commonwealth of Massachusetts, where she served on committees for health, physical education, and dance recreation. As a board member for the nonprofit Institute for Human Centered Design, she advocated for and worked to advance quality of life for individuals needing special assistance. She helped certify high school and BU students on CPR and first aid techniques and was a softball officiant well into her 70s. A dedicated and passionate philanthropist, she volunteered for the American Red Cross for more than 25 years and was a friend of the Boston Symphony Orchestra and Boston Pops.



Carolyn Cohen and her beloved greyhound, Sneakers, who made regular appearances at Sargent.

Those who met her knew Carolyn was the embodiment of Sargent Spirit. A proud Terrier, she devoted herself to a myriad of BU activities, events, and causes. Her dedication to improving the lives and communities of others was matched only by her deep compassion for her canine companions. Before the pandemic, it was common to see Carolyn walking the halls of Sargent, greeting students and staff as she and her greyhound Sneakers made their rounds. She and Sneakers (a particular favorite of recent

graduates) were often invited guests for various student groups, one of the many ways she gave of her time and talents throughout BU.

Carolyn was also a vivid Sargent historian. In 2020, Carolyn was one of the first guests on the *Health Matters* podcast, where she spoke about her time at Sargent—including how the late Dean Makechnie ('29, Wheelock '29, '31, Hon.'72) broadened students' worldview by bringing in notables of the day, like dancer Martha Graham and famed physician Howard Rusk: "One day we danced with Martha Graham, another day, we had a leading doctor," she said. "These were people we saw in our textbooks, and all of a sudden they were before us."

Carolyn served on the Sargent College Alumni Association (SCAA) since graduation and was her class secretary for more than 50 years. She also served as SCAA president, from 1979 to 1984, during Sargent's centennial celebration. Most recently, she was the SCAA reunion representative, helping to organize Alumni Weekend activities and awards ceremonies. In 2015, she received the Dudley Allen Sargent Alumni Award in recognition of her meritorious service to the Alumni Association. She was an honorary Scarlet Key recipient in 1998, and she worked closely with the BU Scarlet Key Honor Society.

Seeing Carolyn was a high point of any day I encountered her. It is an understatement to say I will miss her deeply. And while it's difficult to imagine our community without her, she has left an indelible legacy of compassionate service both here at Sargent and Boston University. ■



Areas of Study

Behavior & Health
Health Science
Human Physiology (premed)
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

NATASHA MOUSTACHE; JANICE CHECCHIO

BU Sargent College

Who We Are

Students	Undergraduate	Graduate
Number of full-time students	1,057	552

Faculty

Full-time	81
Part-time	19

Alumni

20,535 in 74 countries

Clinical Sites

More than 1,200 in 50 states and 3 countries



Sargent College On-Campus Clinical 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

CYDNEY SCOTT

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 in the **top 20** in their respective fields:

- 1** Occupational Therapy Program ranked number 1 out of 198 programs
- 10** Speech-Language Pathology Program ranked number 10 out of 261 programs
- 20** Physical Therapy Program ranked number 20 out of 239 programs

National Certification Board Exam Overall Pass Rates

97%	NUTRITION
98%	OCCUPATIONAL THERAPY
90%	PHYSICAL THERAPY*
98%	SPEECH-LANGUAGE PATHOLOGY

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

*Data averaged over the past two years, per USDE requirements.

ABOUT US Boston University College of Health & Rehabilitation Sciences: Sargent College has been defining healthcare leadership for 140 years. Our learning environment fosters the values, effective communication, and clinical skills that distinguish outstanding health professionals, and we continuously enhance our degree programs to meet their future needs. Our curricula include fieldwork, providing students in every degree program with clinical experience, as well as internships at more than 1,200 healthcare facilities across the country. The college also operates outpatient centers that offer a wide range of services to Greater Boston.



Boston University College of Health
& Rehabilitation Sciences: Sargent College

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